



User Manual



DIGIFLY AIR-BT AIR-SE

Rev. 64a English (Firmware 244)

CONGRATULATIONS

Thank you for choosing Digifly!

You have purchased a high technology instrument designed expressly for free flight. The multiple functions and flight data it provides, effectively make it an on board computer. Learning to use this instrument will make your flying easier in terms of performance and safety. It will enable you to improve your flying technique and make piloting decisions more quickly thanks to the comprehensive flight information that is provided. Another benefit is the ability to download and analyze your flight data afterwards.

The instrument has been designed to allow for future software developments to be easily incorporated via the Internet.

DIGIFLY INTERNATIONAL GUARANTEE

Dear Customer,

Thank you for purchasing this Digifly product which has been designed and manufactured to the highest quality standards. Digifly warrants this product to be free from defects in materials and workmanship for 3 years from the date of purchase.

The Digifly guarantee applies provided the product is handled properly for its intended use, in accordance with its operating instructions and upon presentation of the original invoice or cash receipt, indicating the date of purchase, the dealer's name, the model and the serial number of the instrument.

The customer is however, responsible for any transportation costs. The unit must be securely packaged for return.

The Digifly guarantee may not apply if:

- The documents have been altered in any way or made illegible.
- Repairs or product modifications and alterations have been executed by unauthorized person or service.
- Damage is caused by accidents including but not limited to lightning, water or fire, misuse or neglect, or every malfunction not related to manufacturing defects of your instruments.

If your Digifly product is not working correctly or is defective, please contact your Digifly dealer. In order to avoid unnecessary inconvenience.

Digifly Europe s.r.l.
Bologna

Italy
www.digifly.com
info@digifly.com



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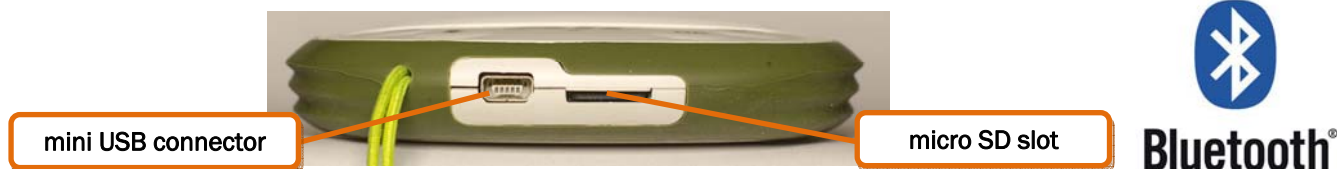
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2 GETTING STARTED

2.1 CONNECTIONS



- The dual purpose mini USB socket allows the Digifly AIR to be recharged via the supplied Digifly 5V charger and additionally connection to a personal computer or to a MAC for configuring & managing flight data.
- Micro SD card slot.
- Bluetooth connection (AIR-BT only).

2.2 BATTERY

- The main power is supplied by an internal rechargeable high capacity lithium battery, that has no memory effect, so it can be partially recharged, without affecting the battery's life. It also has a very low self-discharge rate (more than one year) and works very well at low temperatures. A fully charged battery will power the instrument for over 30 hours.
- When the battery's icon starts to blink there are roughly 4 hours of battery life remaining.

2.2.1 BATTERY RECHARGE

- To recharge the instrument insert the charger plug or other mini USB accessory
- The required time for a full charge is about 8 hours.
- There are no problems if you leave the vario charging for more than 8 hours, as the vario automatically switches to a "maintain mode" which prevents the battery from being overcharged.
- The Digifly AIR's lithium battery has no "memory effect", so it can be also partially charged.

2.2.2 EXTERNAL POWER SUPPLY

- The mini USB socket can be used to power the instrument and simultaneously charge the internal battery..
- An external stabilized 5VDC power supply (e.g. a solar panel) with a minimum of 150mA is necessary to turn on the instrument. Any excess power will be used to charge the internal lithium battery. Proper solar panels are suitable to power the instrument.

2.3 KEYBOARD - NORMAL OR LONG KEY PRESS

- The time length you keep the keys pressed on your Digifly instrument selects the available functions.
- For a **Normal key press** : press the button for less than a second
- For a **long key press** : keep the button pressed down for at least 2 seconds
- When not specified, the key press has to be considered as a normal key press (less than a second).

2.4 TURNING ON & OFF

- To **turn on** your Digifly instrument, press the  key at least for 4 seconds.
- To **turn off** your Digifly instrument, press the  key at least for 4 seconds.
- After switching off your Digifly instrument, you must wait at least 5 seconds before attempting to turn it on again. This prevents unwanted operation.
- After turning on your Digifly instrument, the first screen briefly shows the vario model, pilot name (if set), logger status, vario serial number, software version, date, time and battery voltage.

2.5 DISPLAY CONTRAST ADJUSTMENT

- To change the contrast of the display, press the key  to enter in the “MAIN SETUP” menu, select the menu (MAIN SETUP \ n. 1 CTRS), go to the edit mode pressing the  key, set the preferred contrast using the keys: ‘arrow UP’  or ‘arrow DOWN’ , then save the changes pressing the key .

2.6 MENU

- To navigate the menus of your instrument press the  key (“MENU” function).
- To select the sub-menus navigate the list UP or DOWN using the   arrow keys then confirm your choice pressing the  key (“ENT” function).
- To exit and get back to the main screen press the  key (“ESC” function).

MENU
Wpt Near Airfield
Wpt Nearest
Wpt Competition
Wpt User
Routes
Altimeters
Logbook
AirTools
Main Setup
Advanced Setup
Variometer Setup
Telemetry BT

2.6.1 STANDARD FIELDS EDITING

- To change parameters and settings, select the parameter you want to change navigating UP or DOWN using the ,  keys, press the  key (“EDIT” function) to enter in the edit mode.
- To change the value of the selected parameter use the ,  keys, each parameter’s change is automatically saved (“AUTOSAVE” function), keeping pressed the ,  keys activates quick parameter changing (“AUTOREPEAT” function).
- To exit from the edit function press the  key (“ESC” function).

2.6.2 ALPHANUMERICAL FIELDS EDITING

- Changing the alphanumerical fields is different from the normal editing described in the above paragraph, because it is possible to modify every single character of the field.
- To modify the field press the  key (“EDIT” function) that activates the edit mode.

- Use the arrow keys ,  to change the character shown in reverse mode on the display, each parameter's change is automatically saved ("AUTOSAVE" function), a longer pressure/touch of the arrow keys activates quick parameter changing ("AUTOREPEAT" function),
- Pressing the  key, it is possible to shift to the character on the right and edit it; pressing repeatedly the  key it is possible to scroll toward right all the field's characters until you get back to the first. A longer pressure/touch of the  key shifts back to the left. To exit press the  key.

2.7 MULTI LANGUAGE HELP

- In the vario setup menus help messages are available, to guide you through the parameters. It is possible to set the preferred language for these messages via the MAIN SETUP menu (**MAIN SETUP \ n. 2 LANG**) then select the language you prefer and confirm.
- **IMPORTANT:** after every firmware update, it is necessary to update also the help file containing the help messages. The help file update can be performed from your PC MAC using the Digify AirTools, function: "upload HELP".

2.8 RESTORE FACTORY SETTINGS

- To restore the factory settings (default values for all parameters), turn on the instrument pressing at the same time and holding down the keys  &  until the message "FACTORY SET?" appears. To confirm press the  key or press the  key to cancel/abort.

2.9 RESET

- If a system crash occurs (resulting in the instrument freezing), it is possible to reset its functions by pressing at the same time the keys  and  holding them down for more than 5 seconds.

3 QUICK REFERENCE GUIDE

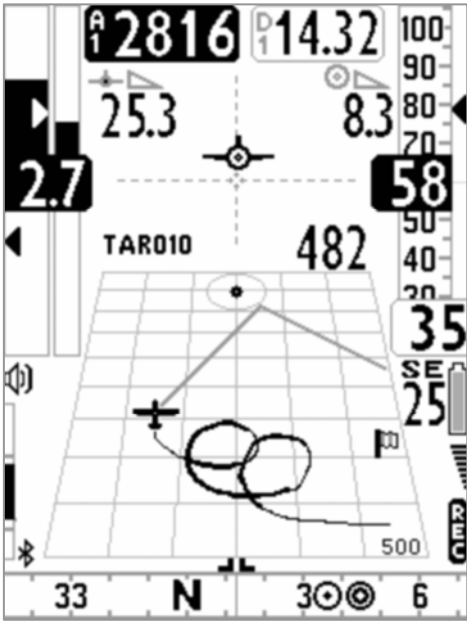
3.1 PAGES

- The Digifly AIR features 13 pages.
- to manually change the pages press the keys  (forward) or  (backward).

3.1.1 MAIN PAGES (MASTER)

- There are 3 main pages (master) that for safety reasons can not be changed or disabled

MASTER PLOTTER PAGE



MASTER COMPASS PAGE



MASTER INFO GPS PAGE



3.1.2 CONFIGURABLE PAGES

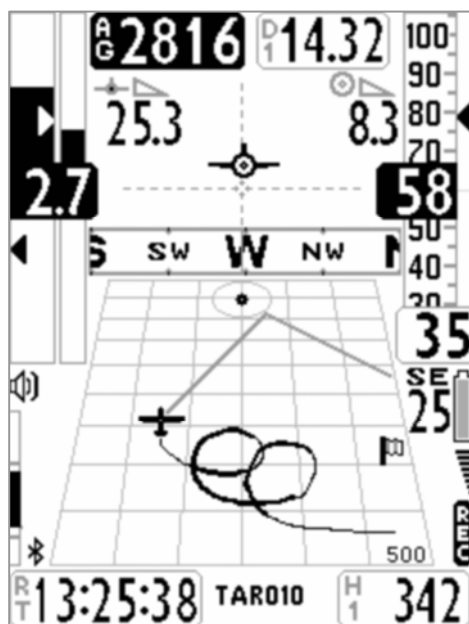
- There are Five (5) configurable pages; at each one of them is linked one of the five (5) configurable parameters (MAIN SETUP\ n. 18 U1PG, n. 19 U2PG, n. 20 U3PG, n. 21 U4PG, n. 22 U5PG) and fore each page is possible to configure a different layout:

OFF = the layout view of the page is disabled (the page will be skipped)

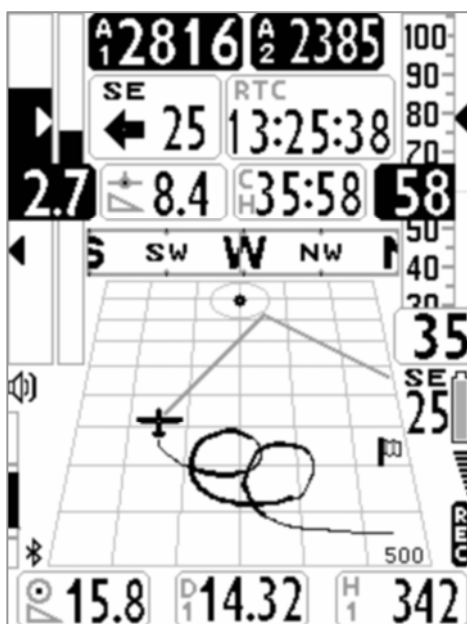
ON = will show the corrisponding layout of the preset page uploaded by Digifly (Preset pages 1,2,3,4,5)

FULL = will show the corrisponding layout of the page "User page 1,2,3,4,5" created and uploaded by the user using the free Digifly program **AirPageConfigurator** (for more details about software usage refer to chapter 14.1.2)

PRESET PAGE 1



PRESET PAGE 2



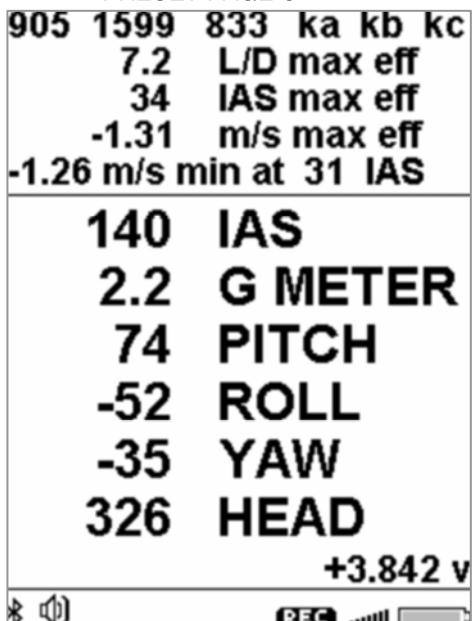
PRESET PAGE 3



PRESET PAGE 4



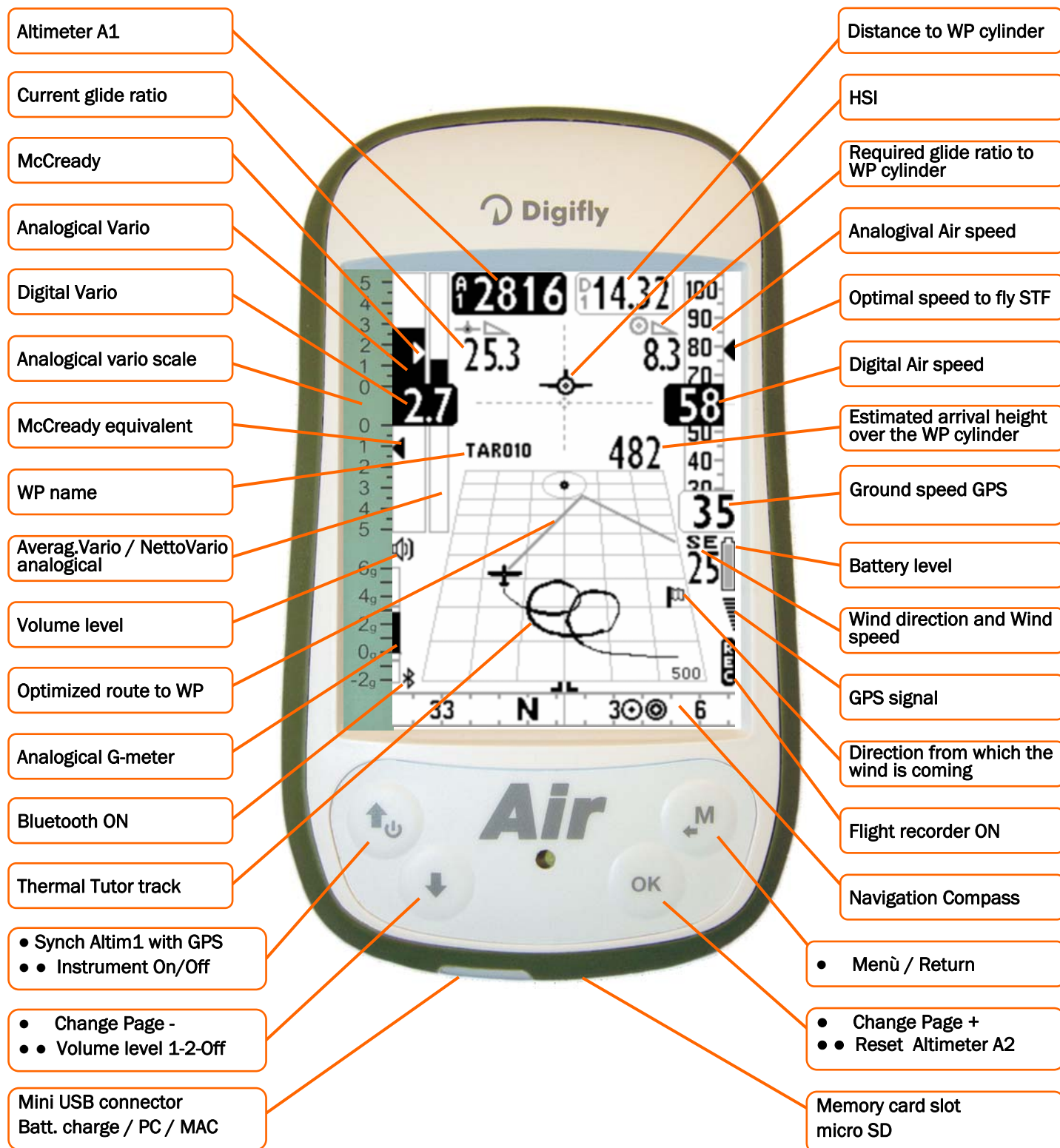
PRESET PAGE 5



3.2 SYMBOLS

	Battery level
	Bluetooth activated
	Normal icon = GPS FIX valid (GPS position available) Blinking icon = low GPS signal (GPS position NOT available)
	Flight recorder on
	Volume level
	Direction toward the center of the current Waypoint
	Direction toward the current WP accordingly to the optimized route
	Direction toward the current WP accordingly to the optimized route
	Last thermal direction
	Direction from which the wind is coming

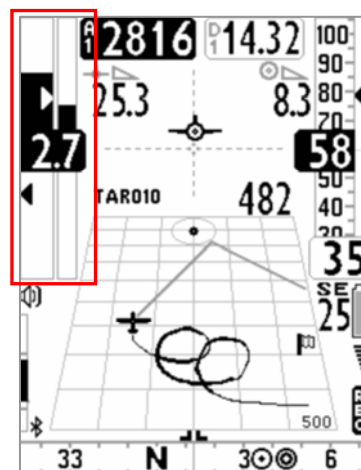
3.3 MASTER PLOTTER PAGE



• = Normal key pressure • • = Long key pressure (2 seconds)

3.3.1 VARIOMETER (PLOTTER PAGE)

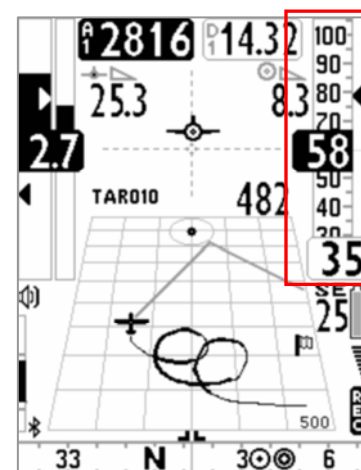
- In the area dedicated to the vario information are shown:
 - o Digital vario;
 - o average vario / Netto vario;
 - o McCready value;
 - o Equivalent McCready value



3.3.2 AIR SPEED / GROUND SPEED (PLOTTER PAGE)

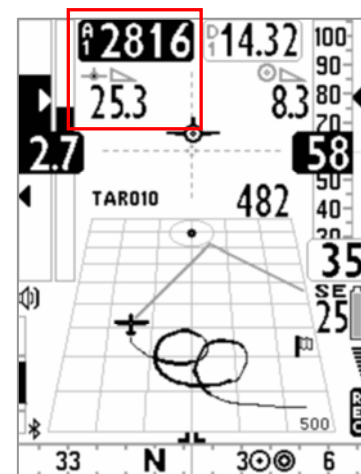
- In the area dedicated to the anemometer information are shown:
 - o Scrolling Analog format value Airspeed IAS/TAS;
 - o Digital format value IAS/TAS;
 - o Ground speed GS;
 - o Optimal speed glide ratio (Speed to fly) STF;

If you are not using the Pitot sensor/tube (optional) only the GS (Ground speed) will then be shown in both analog and digital format.



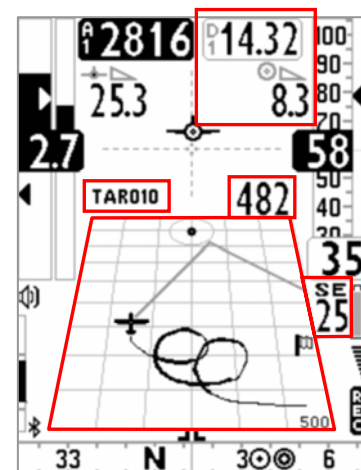
3.3.3 ALTIMETER A1 , CURRENT GLIDE RATIO (PLOTTER PAGE)

- The A1 barometric altimeter and the current efficiency are shown in the top left part of the display.



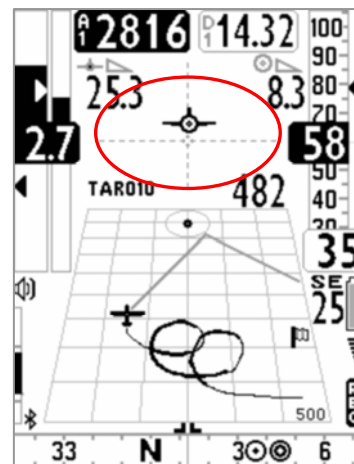
3.3.4 NAVIGATION (PLOTTER PAGE)

- In the PLOTTER page the navigation is mainly graphical:
 - o Representation of the flight track towards the current WPT
 - o Representation of the current WPT cylinder
 - o Optimized route to the current WPT cylinder
 - o Optimized route to the next WPT cylinder
 - o Direction and speed/intensity of the wind
- Digital format of the following informations:
 - o Required glide ratio efficiency to current WPT cylinder and its distance
 - o Expected arrival height to current WPT cylinder
 - o Name of current WPT



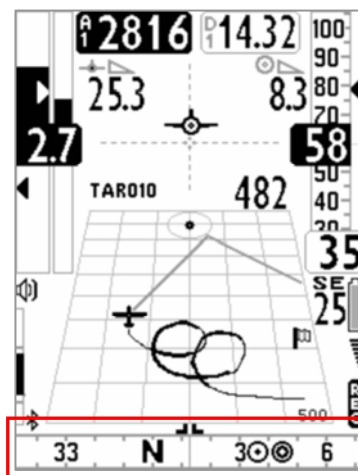
3.3.5 HSI NAVIGATION (PLOTTER PAGE)

- In the center part is shown the HSI, a graphical navigation tool made by two dashed lines that intersect each other indicating the current WPT and its real height. Flying towards the center of the WPT cylinder, the airplane icon moves right or left of the dashed vertical line in case of wrong route and up or down the dashed horizontal line telling us the arrival height with the current gliding ratio

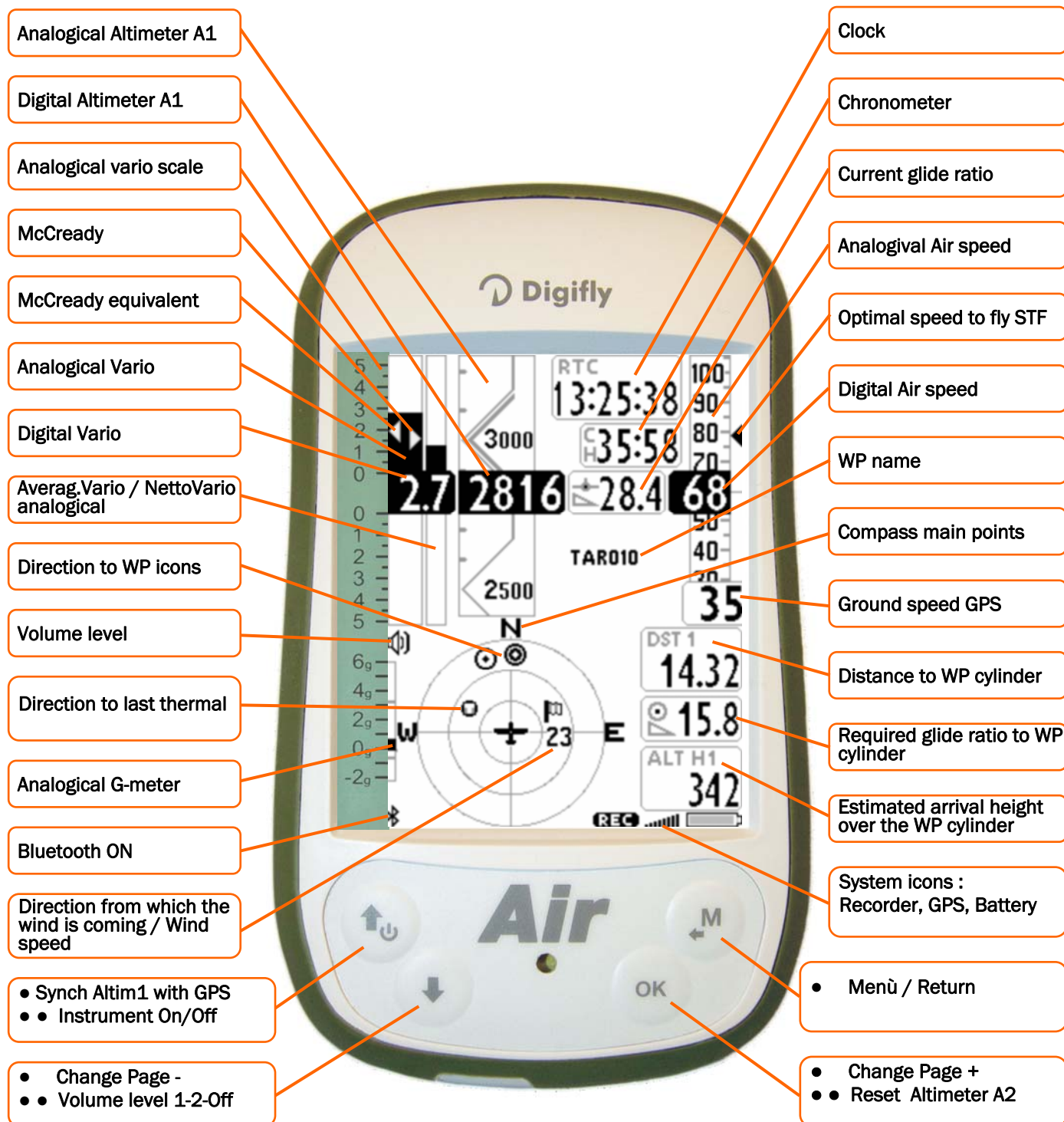


3.3.6 SLIDING COMPASS NAVIGATION (PLOTTER PAGE)

- In the plotter page is visible a scrolling compass containing navigation informations via icons.
- If GPS signal is good the direction is the TRK of GSP track, otherwise is visible the internal magnetic compass.



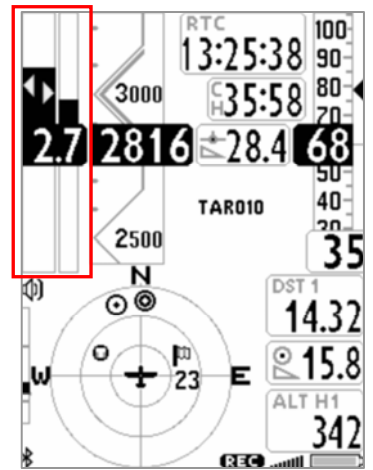
3.4 MASTER COMPASS PAGE



• = Normal key pressure • • = Long key pressure (2 seconds)

3.4.1 VARIOMETER (COMPASS PAGE)

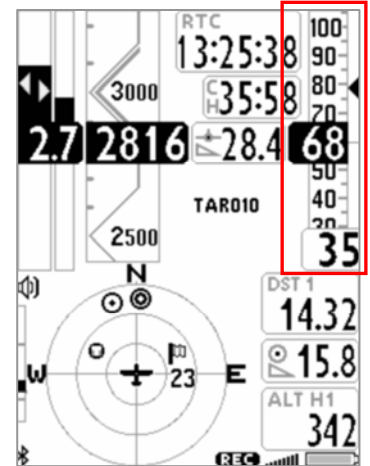
- In the area dedicated to the vario information are shown:
 - o Digital vario;
 - o average vario / Netto vario;
 - o McCready value;
 - o Equivalent McCready value



3.4.2 AIR SPEED / GROUND SPEED (COMPASS PAGE)

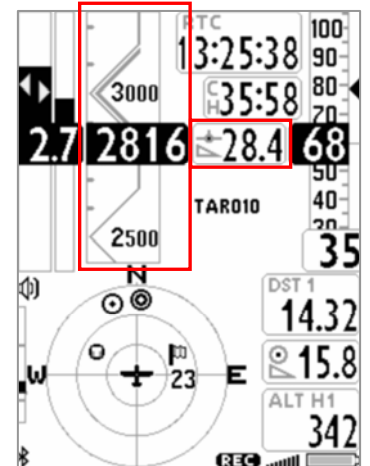
- In the area dedicated to the anemometer information are shown:
 - o Scrolling Analog format value Airspeed IAS/TAS;
 - o Digital format value IAS/TAS;
 - o Ground speed GS;
 - o Optimal speed glide ratio (Speed to fly) STF;

If you are not using the Pitot sensor/tube (optional) only the GS (Ground speed) will be shown in both analog and digital format.



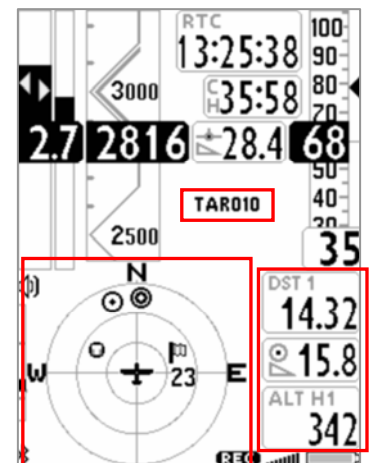
3.4.3 GRAPHIC ALTITUDE A1, CURRENT GLIDE RATIO (COMPASS PAGE)

- Beside the digital variometer we find the A1 graphic altimeter and current efficiency.
- **Graphic Altimeter** : digital value of A1 altimeter is integrated with the graphic scrolling altimeter. With a friendly scale and numeric indications every 500 meters embedded into an angular graphic view making more readable the numbers in the thousands. There is even a simple graduated scale for meters in the hundreds.

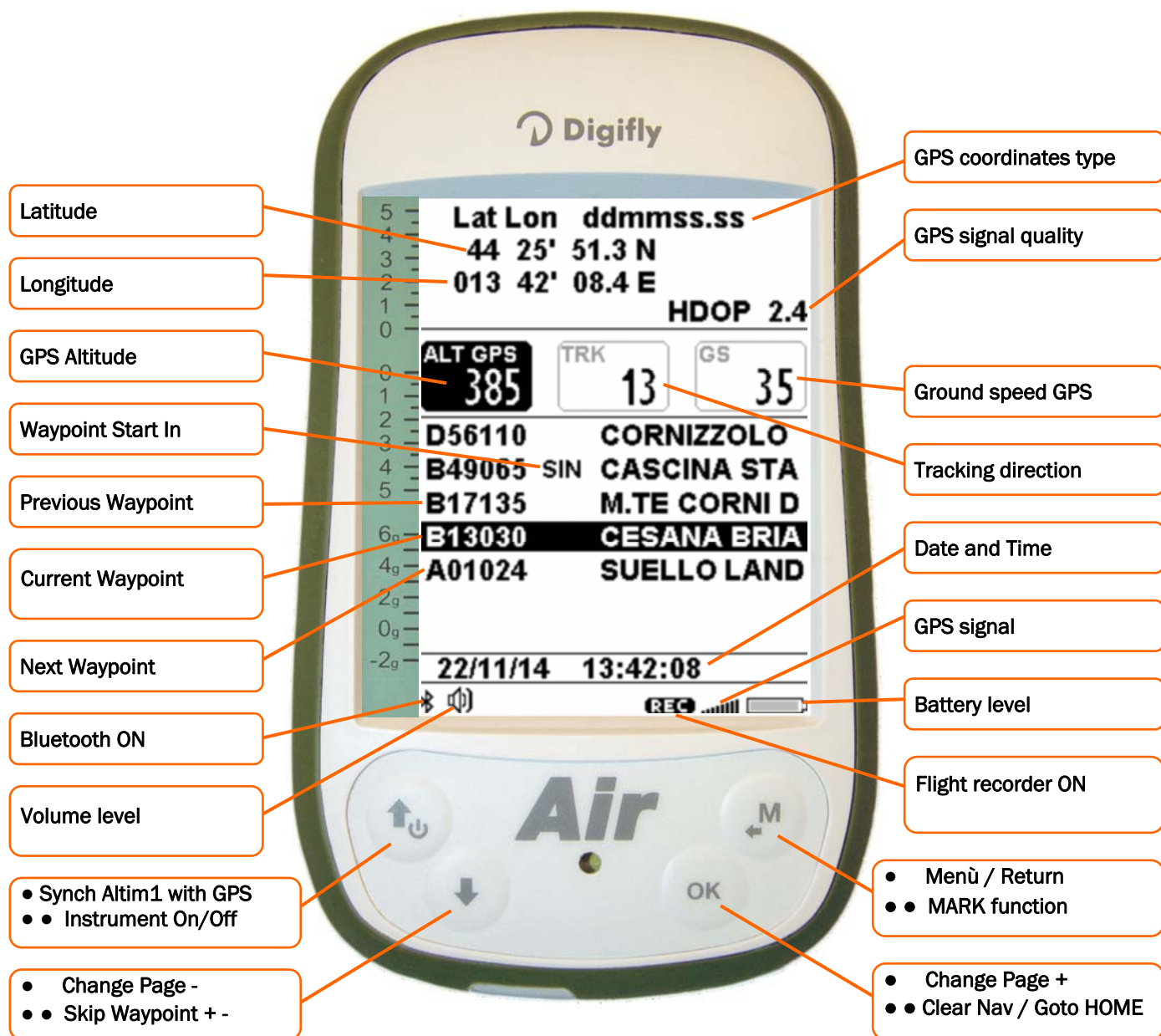


3.4.4 NAVIGATION (COMPASS PAGE)

- In the compass page, navigation is shown with a number of concentric rings in which icons are moving:
 - in the outside ring there are the cardinal points N-E-S-W;
 - in the thicker ring there are the direction icons to WP;
 - in the inner ring there are the direction icons to the thermal, wind direction and speed.
- You can also find the following digital informations:
 - glide ratio needed to the current cylinder WPT and its distance
 - Expected arrival height to current Cylinder WPT
 - Name of current WPT



3.5 MASTER INFO GPS PAGE



• = Normal key pressure • • = Long key pressure (2 seconds)

In the MASTER INFO GPS page, are visible all values relative to your GPS position and particular functions available only on this layout: function "take me here" (GOTO HOME), function "save current position" (MARK), function "cancel current navigation" (CLEAR NAV) and supervision real time function "**Real Time Navigation Manager**" of progress active route with the chance to go back and forth through WPT (function "**Skip Waypoint**").

3.5.1 GPS STATUS INFORMATION

The GPS icon signal has different meanings:

- GPS icon on steadily = Correct GPS FIX (GPS position available) 
- GPS icon blinking = poor signal (GPS position NOT AVAILABLE)

3.5.2 LATITUDE & LONGITUDE COORDINATES

- The latitude and longitude coordinates are shown in the top part of INFO GPS page and are referenced as map datum WGS84.

3.5.3 LATITUDE & LONGITUDE COORDINATES OPTIONS

- There are available 3 different types of coordinates:

DMS = degrees, minutes and seconds (dd° mm' ss.s) (default)

DMM = degrees and minutes (dd° mm.mmm')

UTM Universal Transverse Mercator (utm x, y, zona).

To set up the chosen DMM, DMS or UTM utilizzare il parametro (**ADVANCED SETUP \ n. 22 CORD**).

3.5.4 GPS SIGNAL QUALITY (HDOP)

- The HDOP value represents the weakening of GPS signal. Small values mean good precision.

3.5.5 GPS ALTITUDE

- GPS altitude ("ALT GPS") represents the height over sea level given by the GPS system.

3.5.6 GPS DIRECTION (TRK)

- GPS direction ("TRK") represents the aircraft direction relatively to ground.

3.5.7 GPS GROUND SPEED

- The GPS ground speed is the aircraft speed relatively to ground ("Gs").

3.5.8 REAL TIME NAVIGATION MANAGER / SKIP WAYPOINT

- The central part of the GPS INFO page shows in real time navigation progress of active route; is shown a waypoint list of active route, highlighting in "reverse" the current one.
- With the "**Skip Waypoint**" function is possible to move back and forth from the current waypoint:

only from **GPS INFO** page, if the navigation to route is active, press the button  (long pressure), and a menu will appear, press button  to jump to previous Waypoint or press  to jump to following Waypoint or press  to cancel.

- In case is active navigation to a single waypoint, the central part of **GPS INFO** page will show only the name of current waypoint.

3.5.9 CREATING A NEW WAYPOINT USING THE CURRENT POSITION (MARK)

- "MARK" function : when the GPS acquires a valid position it is possible to save it in the instrument's memory.

From the **GPS INFO** page press the key  (long press) , the message " Save Mark ?" is shown, press the  key to confirm or press the  key to annul. The current position will be saved as a new Waypoint in the User Waypoint list ("WPT USER") with the format nnMaaa (aaa= altitude GPS in tens of meters)

3.5.10 NAVIGATION TO WAYPOINT HOME (GOTO HOME)

- Available only in the **GPS INFO** page, ensures that the instrument guides us back to the point where we activated this function.

It's particular useful, for example, when we go flying in a new site of which we don't have waypoints and we want to get guided to the landing zone . In this case is necessary to go to the landing zone and activate this function.

How activate the "GOTO HOME" function : from the **GPS INFO** page, wait till the GPS position is valid, then press

the  key (long press) , the message " Activate Home Wpt ?" is shown, press the  key to confirm or press the  key to annul.

Note : if a navigation has already been previously activated, first of all is necessary to deactivate it : from the

GPS INFO page press the  key (long press) , the message " Clear Nav ?" is shown, press the  key to confirm or press the  key to annul.

The "GOTO HOME" function creates a landing waypoint in the User Waypoint list ("WPT USER") with the current position data "HOMaaa" (aaa = GPS altitude in tens of meters) and with the icon "A" (airfield) and at the same time activates the navigation (GOTO) to it.

3.5.11 DEACTIVATING THE CURRENT NAVIGATION (CLEAR NAV)

- Function "Clear Nav" : to disable current navigation, press button  (long pressure) , " Clear Nav ?" will appear, confirm with button  or press  to cancel.

3.5.12 DATE & TIME

- Date and current time get automatically updated with GPS data when you start the instrument.
- To set your country time zone (**MAIN SETUP \ n. 7 UTCO**).
- To manually change date and time (**MAIN SETUP \ n. 8 HOUR**), (**MAIN SETUP \ n. 9 MIN**), (**MAIN SETUP \ n. 10 DAY**), (**MAIN SETUP \ n. 11 MONT**), (**MAIN SETUP \ n. 12 YEAR**)

4 MAIN FUNCTIONS

4.1 ALTIMETERS

- The Digifly AIR features 6 different altimeters: ALT 1, ALT 2, ALT 3, ALT GPS, ALT H1 e ALT HA.
- **ALT 1 (A1)** : Barometric altimeter.
- **ALT 2 (A2)** : Altimeter A2.
- **ALT 3 (A3)** : Last thermal height gain
- **ALT GPS (AG)** : Altimeter GPS.
- **ALT H1 (H1)** : Estimated height over the cylinder of the current WP
- **ALT HA (HA)** : Estimated height over the cylinder of the goal.



4.1.1 ALTIMETERS SETTINGS

- Goto the **"ALTIMETERS"** menu and select which altimeter you want to adjust (A1 or A2). Important : while the recorder is activated is not possible to adjust the altimeter A1
- When GPS signal is available, and barometric altimeter **ALT1** is not been manually setted, it will be synchronized with GPS altitude value.

To set manually **ALT 1** altimeter with GPS altitude value press button

Important : while the recorder is activated is not possible to synchronize the **ALT 1**

- The A2 altimeter is suitable for general purpose, to reset it press the key (long pressure).
- The A3 altimeter is automatically reset while entering in a thermal.
- The altimeters can be shown in meters (mt) or feet (ft). Parameter (**MAIN SETUP \ n. 13 U-AL**).

4.2 VARIOMETERS

4.2.1 10 SENSORS VARIOMETER WITH SELF-ADAPTIVE SENSITIVITY

- It's a revolutionary digital system designed by Digifly, based on a sophisticated data acquisition system updated 100 times each second that merges 10 sensors : the atmospheric pressure sensor data with the 9 sensors inertial platform data (3 accelerometer, 3 magnetometer and 3 gyroscopes).
- This system is also equipped with a **self-adaptive sensitivity** that auto-modulates the instruments sensitivity according to the airs situations: increasing it in weak conditions and decreasing it in strong conditions or turbulences

This allows to get a vario with an high sensitivity and instantaneous response yet fluid and immune to the turbulences and very helpful in weak conditions thanks to its pre-thermal function. Furthermore, in contrast to the traditional variometers based on a pressure sensor only, it is not affected by false readings due to accelerations.

- **Important Notes** : The mathematical method that manages the variometer as been optimized to obtain an excellent response during flights; for this reason we suggest to try or compare it flying and not on the ground. Even though the system is totally automated it's possible to manually force values of some filters (only for expert users) :
 - o Filter 1, parameter (**VARIOMETER SETUP \ n. 10 FLT1**), default value 80% , (suggested range from 70% to 95%). Reducing this value makes the vario very sensitive to variations.
 - o Filter 2, parameter (**VARIOMETER SETUP \ n. 11 FLT2**), default value 72, suggested range from 48 to 96, reducing this value makes the vario very sensitive to variations.
 - o Filter 3, parameter (**VARIOMETER SETUP \ n. 12 FLT3**), default value 0%, suggested range from 0% to 10%
 - o Filter 4, parameter (**VARIOMETER SETUP \ n. 13 RVAR**), default 0. Increase this value to reduce reactivity.

4.2.2 DIGITAL VARIO

- Shows instant climbing or descending values in a range of +/- 25 m/s in digital format.

4.2.3 ANALOGICAL VARIO

- Indicates the instant vario values. It is displayed by the analogical bar indicator on the left of the screen, it shows the sink or climb rate within a +/- 5 m/s range.

4.2.4 INTEGRATED (AVERAGE) VARIO

- Shows the integrated vario values. This means an average data reading (slowed down in the time) of the instant vario (it can be changed with the value of netto vario, see section. 4.2.6).
- Can be set slowed down or immediate. Setting to the minimum the integrated vario value, the shown value will be the same of the instant vario (factory setting).
- It can be used to monitor the proceeding of the climb to see if it is getting better or worse. For example: if the integrated vario value is higher of the instant vario one, means that previously the climb was stronger. It can be used therefore to better core the thermal.
- To change the integration time, set the parameter: (**VARIOMETER SETUP \ n. 14 INTE**) from 0 to 60 seconds.
- It is analogically displayed on the right of the instant variometer, with a bar showing the climb or sink rate with a range +/- 5 m/s.

4.2.5 NETTO VARIO (WITH OPTIONAL PITOT TUBE)

- If this parameter (**ADVANCED SETUP \ n. 9 POLA**) is set to "OFF", all information related to **McCready**, **McCready Equivalent**, and **Netto Vario** are not displayed on the instrument
- It is shown through an analogic scale on the right of the instant variometer that shows the climb or sink rate within a range +/- 5 m/s. (changeable with integrated vario value, see section. 4.2.6).
- To use this function it is necessary to set the proper polar of your glider.

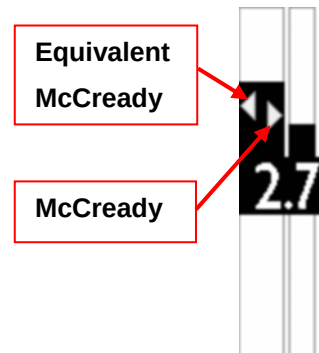
4.2.6 INTEGRATED VARIO / NETTO VARIO AUTOMATIC SWITCH

- You can change vario indicators layout using (**VARIOMETER SETUP \ n. 18 DSEL**) :
0 = (default) , right analog bar shows average vario values, while digital indicator always shows instant vario values .
1 = right analog bar and digital indicator always show average vario values.
2 = right analog bar and digital indicator always show netto vario values.
3 = Data shown from right analog bar and digital indicator changes depending on effective flyght conditions: when you are gliding right analog bar and digital indicator both show netto values, when you ar thermaling right analog bar shows average vario values and digital indicator show instant vario values.
4 = Data shown from right analog bar and digital indicator changes depending on effective flyght conditions: when you are gliding right analog bar and digital indicator both show netto values, when you ar thermaling right analog bar and digital indicator both show average vario values.
See setion 6.12 (Thermal Tutor) for extra details on gliding mode and thermaling mode.
- When netto vario value is shown "NET" icon will appear in the right bar.



4.2.7 McCREADY (WITH OPTIONAL PITOT TUBE)

- If this parameter (**ADVANCED SETUP \ n. 9 POLA**) is set to “OFF”, all information related to **McCready**, **McCready Equivalent**, and **Netto Vario** are not displayed on the instrument.
- The McCready value is the average lift value of the last “nn” minutes
- To adjust the average lift time go to (**ADVANCED SETUP \ n. 19 MCRA**).



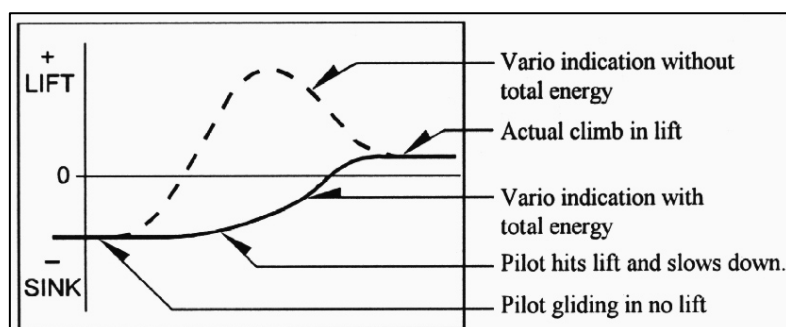
4.2.8 EQUIVALENT McCREADY (WITH OPTIONAL PITOT TUBE)

- If this parameter (**ADVANCED SETUP \ n. 9 POLA**) is set to “OFF”, all information related to **McCready**, **McCready Equivalent**, and **Netto Vario** are not displayed on the instrument.
- This value indicates the Equivalent McCready value: this means the McCready value considering the current air speed as the optimal speed.
- The equivalent McCready, based on the glider's polar, the sink rate and the current airspeed (IAS), indicates in real time at with which true McCready value we are flying compared to the optimal speed. When this value coincides with the one estimated in the thermal, this means that the current airspeed (IAS) coincides with the optimal speed (see “speed to fly” paragraph).
- To set the reaction time of the Equivalent McCready indicator go to (**ADVANCED SETUP \ n. 20 MCRE**).

4.2.9 TOTAL ENERGY COMPENSATION (WITH OPTIONAL PITOT TUBE)

- To use this function it is necessary to install the optional Pitot tube.

- Generally a variometer works as follows: it feels the atmospheric pressure change rate considering it as an altitude change, but, if during the flight the pilot slows the glider (and even more if he does it quickly) there is a real change of pressure, so a vario ‘without compensation’ records it as a climb, but this variation is caused by a change of speed (kinetic energy) not a true thermal.



- With the total energy compensation, the part of the climb due to the change in velocity is ignored, allowing you to identify “real” thermals.
- To properly set the TOTAL ENERGY compensation value go to (**VARIOMETER SETUP \ n. 17 TEC**), to do it you should fly in calm air conditions and slow down as if you are entering a thermal. If the vario shows a change in lift, you have to increase the total energy compensation value, until the change in velocity isn't recorded as lift.
- A typical value for hang gliders is 65. The default setting of “0” deactivates the total energy compensation function

4.2.10 ACOUSTIC VARIO

- The acoustic vario represents the instantaneous values of the vario with a modulated acoustic tone.
- Pressing the key  (long pressure) the sound's volume changes into three levels: "HIGH", "OFF" & "LOW". The chosen volume is shown by the 'loudspeaker' icon on the center left of the display.
- To set the sound's threshold level to indicate lift, go to parameter (**VARIOMETER SETUP \ n. 1 V.UP**), for the sink, go to (**VARIOMETER SETUP \ n. 3 V.DN**).
- It is possible to set the preferred acoustic profile with the parameter (**VARIOMETER SETUP \ n. 4 PROF**). Three pre-set profile are available: FAS, STD, SFT, Two fully customizable profile: USR1, USR2 are available via PC/MAC using the AirTools software; moreover, there is a manual 'MAN' mode, that allows to directly customize the instrument using the following parameters.
- **Style**, (**VARIOMETER SETUP \ n. 5 STYL**) relation among sound/pause, values from 1 to 3.
- **Modulation**, (**VARIOMETER SETUP \ n. 6 MODH**) increases the tone frequency from 1 to 30 Hz.
- **Pitch**, increases ascending the tones rhythm (**VARIOMETER SETUP \ n. 7 PITC**) values from 1 to 4.
- **Climb** start tone's frequency (**VARIOMETER SETUP \ n. 8 UPHZ**)
- **Sink** start tone's frequency (**VARIOMETER SETUP \ n. 9 DWHZ**)
- **Autosilence**, (**VARIOMETER SETUP \ n. 20 AUTV=ON**) activates the acoustic vario only after the takeoff and stops it 60 seconds after the landing.

4.2.11 ACOUSTIC VARIO PRE-THERMAL TONE

- If activated, an acoustic signal with a tone and modulation significantly different of the acoustic vario, indicates that we are near a thermal (the instantaneous sink rate is better of the glider's minimum sink rate, therefore indicating an area of slightly climbing air). To set the pre-thermal sound's start threshold go to: (**VARIOMETER SETUP \ n. 2 V.PT**) value from 0,00 to 1,50 m/s. Suggested value 0,50 m/s.

4.2.12 VARIO SIMULATOR

- For a perfect tuning of the acoustic vario without flying, it is possible to set the 'vario simulator' mode, setting "ON" the parameter (**VARIOMETER SETUP \ n. 19 SIMV**) and setting "OFF" the parameter (**VARIOMETER SETUP \ n. 20 AUTV**). Then exit from menu and use the arrow keys ,  to set the preferred vario sound.
- To deactivate the simulator set to "OFF" the parameter "SIMV". **Note:** for safety reasons the simulator is automatically deactivated when the instrument power on.

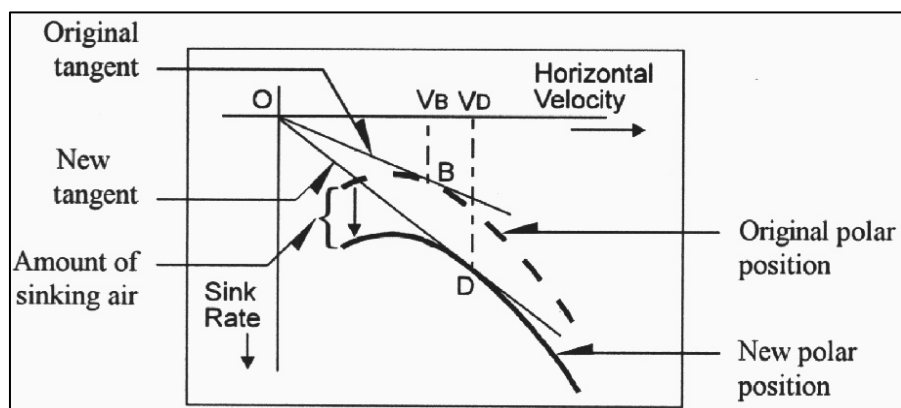
4.3 AIR SPEED (WITH OPTIONAL PITOT TUBE)

- This sensor measures the glider's air speed.
- This function is available only installing the Pitot tube sensor module (optional). The tube will have to be inserted in the specific housing hole located on the instrument's top, and the parameter (**ADVANCED SETUP \ n. 1 PITO**) have to be setted on desired value : **IAS** (Indicated Air Speed) or **TAS** (True Air Speed) .
- It is possible to set the speed's unit of measure to km/h or mph using the parameter (**MAIN SETUP \ n. 16 U-SP**)
- The minimum speed indication is 18 km/h.



4.3.1 SPEED TO FLY (WITH OPTIONAL PITOT TUBE)

- If this parameter (**ADVANCED SETUP \ n. 9 POLA**) is set to "OFF", all information related to **McCready**, **McCready Equivalent**, and **Netto Vario** are not displayed on the instrument.



- Speed to Fly (STF) is the best anemometric speed to obtain the best glide ratio. This value depends on performance of your glider as well as vertical and horizontal airflow. In calm air, the optimum flying speed is the same as the best glide speed (point B).
- The diagram shows different values of speed to fly value related to different flight conditions
- The X-axis shows horizontal speed, the Y-axis shows sink rate. With head wind or sink conditions, the best glide speed increases. In order to find the optimum speed to fly value in sink conditions, add the sink rate of the air to the polar of your glider, drawing a new polar and a new tangent line from the initial point of axes. The new tangent (point D) meets the polar at the point giving a higher optimum flying speed VD.
- To fly at the correct "Speed to fly" you have to adjust your anemometric speed "IAS" to overlap the triangle symbol with the numeric value of the optimal anemometric speed.



Speed to fly

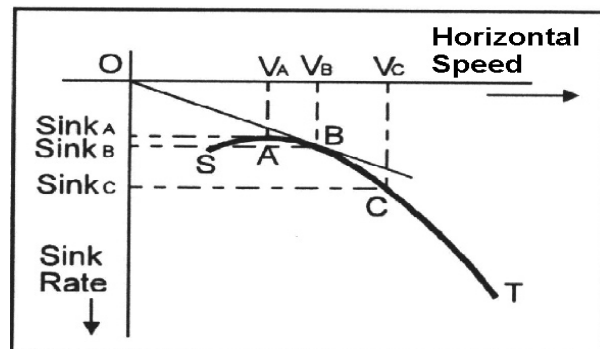
Posizione
indicatore
STF
ottimale

4.3.2 AIR SPEED CALIBRATION (WITH OPTIONAL PITOT TUBE)

- It is possible to perform a fine tuning of the air speed using the parameter (**ADVANCED SETUP \ n. 3 KIAS**) it indicates the air speed correction value (100%=no correction, 110%=increase, 90%=decrease).
- Warning:** incorrect adjustment of this parameter will make the air speed reading inaccurate, the calibration of the air speed with the Pitot tube should have done at the sea level in standard atmosphere conditions.

4.4 POLAR (WITH OPTIONAL PITOT TUBE)

- A polar curve (shown in bold on the figure) is the graph of your glider's sink rate over its speed range.
- The black bold curved line represents the polar. The glider's stall speed is shown at point **S** on the left and the glider's max speed at point **T** on the right of the graph.
- On the graph, you can also see three pairs of relative speed readings and sink rates. The graph shows at point **A**, the lowest sink rate achieved at the top of the curve. Therefore



SinkA is the minimum sink rate and **VA** is the speed at which this is achieved.

- The glide ratio is the ratio between the glider's horizontal speed and the sink rate. To find the best glide rate on the graph, it is necessary to draw a straight line from the origin of the graph (point **O**) tangent of the curve.
- The intersection of the tangent with the curve (point **B**) shows the speed to fly at to achieve the best glide (air related) is therefore **VB** and the glide ratio is **VB/SinkB**.
- On your Digifly AIR you can insert three different polars using the function (**ADVANCED SETUP \ n. 10 - 18 Px-A/B/C**). To choose which polar to use, go to (**ADVANCED SETUP \ n. 9 POLA**).
- If this parameter (**ADVANCED SETUP \ n. 9 POLA**) is set to "OFF", all information relating to **McCready**, **McCready Equivalent**, and **Netto Vario** are not displayed on the instrument.
- On the instrument there are three preloaded polars, (2 for hang gliders and 1 for a paraglider). Using the Digifly AirToolS software, available on the Digifly web site (www.digifly.com), it is possible to see the values of the three default polars and to set your own polar.
- We suggest that you insert your own polar curve data which best reflects the actual performance of your glider.
- If one of the 3 polar curves is active, in the top part of "PRESET 5 PAGE" layout, will be shown its main features
 - ka, kb, kc coefficients
 - Best efficiency value (L/D max eff)
 - airspeed in km/h at max efficiency
 - descending rate at max efficiency (m/s max eff)
 - minimum descending rate and corresponding airspeed

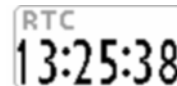
905	1599	833	ka	kb	kc
	7.2		L/D max eff		
	34		IAS max eff		
	-1.31		m/s max eff		
-1.26	m/s min at		31	IAS	

4.5 BAROMETER

- The barometer displays the atmospheric pressure in millibar.
- It is possible to adjust the calibration by changing the parameter (**ADVANCED SETUP \ n. 4 KBAR**).
- Important : while the recorder is activated is not possible to change this parameter.
- Warning: incorrect adjustment of this parameter will make the barometric altimeters less accurate

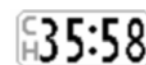
4.6 TIME

- The current time **RTC (RT)** is automatically synchronized with the GPS data at the instrument's power on.
- To set the time zone for your country go to (**MAIN SETUP \ n. 7 UTCO**).
- To manually adjust the time and date, go to (**MAIN SETUP \ n. 8 HOUR**), (**MAIN SETUP \ n. 9 MIN**), (**MAIN SETUP \ n. 10 DAY**), (**MAIN SETUP \ n. 11 MONT**), (**MAIN SETUP \ n. 12 YEAR**).



4.7 CHRONOGRAPH

- The Chronograph **CHRONO (CH)** is automatically reset to zero when the recorder starts.



4.8 PILOT'S NAME & GLIDER'S DATA

- To set the pilot name, the glider type and the glider id, go to (**MAIN SETUP \ n. 15 PILO**), (**MAIN SETUP \ n. 16 GTYP**), (**MAIN SETUP \ n. 17 GID**).

6 GPS FUNCTIONS

6.1 INTEGRATED 99 CHANNELS GPS RECEIVER

- Digifly AIR features an extremely sensitive, and state-of-the-art, 99 channels integrated GPS receiver.

6.2 GPS STATUS INFORMATION

- The GPS status icon has different meanings:
 - 1) Fixed GPS icon = GPS FIX valid (GPS position available) 
 - 2) Blinking GPS icon = insufficient signal (GPS position NOT AVAILABLE)

6.3 GPS SIGNAL QUALITY (HDOP)

- The HDOP value represents the weakening of GPS signal. Small values mean good precision.

6.4 LATITUDE & LONGITUDE COORDINATES

- The latitude and longitude coordinates are displayed on the upper part of the INFO GPS page and are referred to WGS84 map datum.

6.5 LATITUDE & LONGITUDE COORDINATES OPTIONS

- Three different kinds of coordinates are available:
 - DMS** = grade, minute & second (dd° mm' ss.s) (default)
 - DMM** = grade & minute (dd° mm.mmm')
 - UTM** Universal Transverse Mercator (utm x, y, zone).
- To set the coordinates DMM, DMS or UTM use the parameter (**ADVANCED SETUP \ n. 22 CORD**).
- The latitude and longitude coordinates are referred to WGS84 map datum.

6.6 GPS ALTITUDE

- The GPS altitude ("AG") is the height above the sea level accordingly to the GPS satellite system.

6.7 GPS GROUND SPEED

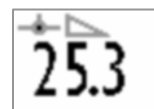
- The GPS ground speeds is the glider speed related to the ground ("Gs").

6.8 GPS DIRECTION (TRK)

- The GPS direction ("TRK") is the glider's direction related to the ground.

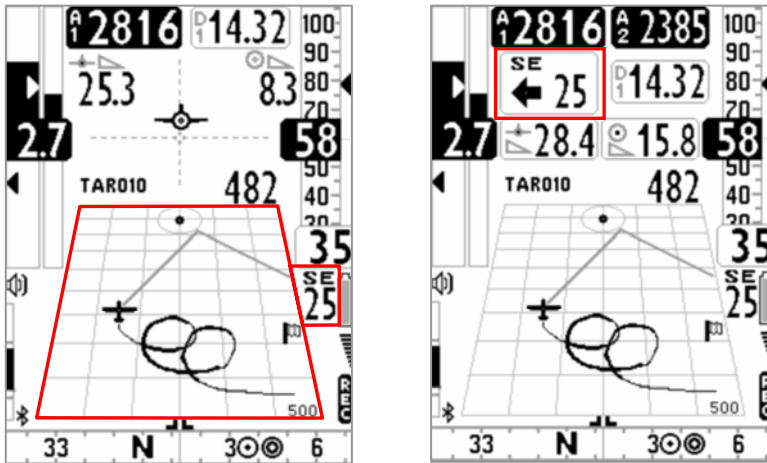
6.9 GROUND EFFICIENCY (GLIDE RATIO)

- It shows the efficiency (glide ratio) related to the ground.
- To set the time over which the average efficiency (glide ratio) is calculated, go to (**ADVANCED SETUP \ n. 7 EFF**).
- If the "ground speed" slows below the 2km/h or the GPS signal is not valid, the indicator shows: " 0.00 ".
- If you are in lift, the efficiency indicator is in reverse mode and shows the average efficiency calculated during the last glide, go to (**ADVANCED SETUP \ n. 8 EFFA**) to set the time to be used to calculate the average efficiency (glide ratio) to be used for the glide calculation to WP
- The average efficiency value is very important because it is the value used by the glide computer.



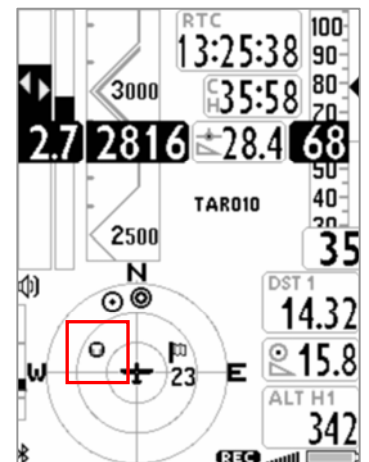
6.10 WIND SPEED AND DIRECTION INDICATION USING GPS

- The wind speed and its direction are automatically calculated using the GPS info Tracking (“TRK”) and the “ground speed (“Gs”) .
- To determine the wind speed and its direction, you should make a “normal” turn, which has to be neither too tight, nor too wide. It is also important to maintain constant airspeed during the turn.
- For an accurate calculation at least a 360° turn must be completed.
- This function uses the parameter (**ADVANCED SETUP \ n. 21 WSEN**) for the wind calculator sensibility (default 5)



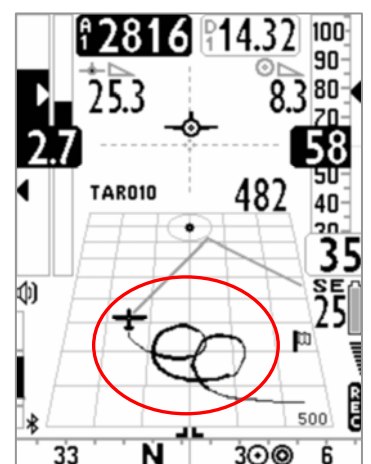
6.11 LAST THERMAL DIRECTION, DISTANCE, HEIGHT INFORMATION

- The data: direction “BRG T”, distance “DST T” and altitude gain “A3” are shown on the display when it is detected a thermal.
- To define a thermal, this function uses the parameter (**VARIOMETER SETUP \ n. 16 THET**) to define the lift’s minimum duration in seconds.



6.12 THERMAL TUTOR

- Thermal tutor is an innovative function capable to help you to center thermals because it draws the thermal track in the plotter using lines with changing thickness : narrower when descending and thicker when climbing. So it becomes very intuitive find the core of thermal.
- Track on the plotter is drawn with a new zoom factor (autozoom) each time you change kind of flight: from thermaling to gliding and vice versa.
- Switch from gliding mode to thermaling mode when it feels a new thermal for more than x seconds (**VARIOMETER SETUP \ n. 16 THET**) default=2 seconds. When this happens plotter cleans up and zoom is rised to maximum capacity.
- Switch from thermaling mode to gliding mode when it doesn’t reveal any more thermal for more than x seconds (**VARIOMETER SETUP \ n. 15 CRUT**) default =30 seconds. When this happens plotter cleans up and the zoom is automatically set on the basis of calculated distance between current position and current waypoint so both can be shown on the plotter.



7 WAYPOINT MANAGEMENT

7.1 DATABASE WAYPOINT COMPETITION AND WAYPOINT USER

Two waypoint databases are available :

- Competition Waypoints (“WPT COMP”) and User Waypoints (“WPT USER”). For each database, 186 waypoints may be saved.
- To visualize the Waypoint list press the key  (“MEN” function) and select the desired WP list.
- The Waypoints can be manually created or can be downloaded from a PC using the AirTools or GpsDump software. On a MAC, GpsDump ‘MAC’ version is available. It is also possible to transfer the Waypoints from Digifly AIR to the other via BT.

7.1.1 CREATING A NEW WAYPOINT MANUALLY

- To create a new Waypoint, in the menu, put the cursor on the first database’s dotted line, and then press the key  (“EDIT” function).
- The “EDIT” function is described in the chapters 2.6.1 and 2.6.2.
- **Name:** 6 characters, format aaaNNN (aaa = 3 alphanumeric characters, NNN = waypoint altitude above sea level, in tens of meters). Note: if the field NNN doesn’t contain three numbers, then the navigation uses the field Altitude.
- **Sym** : numbers from **0** to **9** or the letter **A** to identify an official landing zone (Airfield)
- **Note** : alphanumerical, 16 characters available
- **Lat / Lon**: Latitude and longitude.
- **Altitude**: altitude in meters. Note: this field is used only if the field NNN of the waypoint’s name doesn’t contains three numbers.
- **Near**: distance in meters that activates the fast frequency flight recorder (one second scan).
- **Radius** : radius in meters of the waypoint’s cylinder

Name		Sym
0 4 M 0 1 1		
S T A R T		
Lat Lon ddmms.ss		
44 29' 08.1N		
011 16' 59.9E		
Altitude	0110	m
Near	0100	
Radius	01400	

7.1.2 CREATING A NEW WAYPOINT USING THE CURRENT POSITION (MARK)

- When the GPS acquires a valid position it is possible to save it in the instrument’s memory using the function “MARK”.
- From the **GPS INFO** page press the key  (long press) , the message " Save Mark ?" is shown, press the  key to confirm or press the  key to annul. The current position will be saved as a new Waypoint in the User Waypoint list (“WPT USER”) with the format nnMaaa (aaa= altitude GPS in tens of meters) and the barometric altimeter A1 will be synchronized with the value of the GPS altitude.

7.1.3 EDIT WAYPOINT

- To modify (edit) an existing Waypoint, scroll through the list using the arrow keys  or  until the cursor is on the desired one, then press the key  (“EDIT” function).
- The “EDIT” function is described in the chapters 2.6.1 and 2.6.2.

7.1.4 DELETE WAYPOINT

- To delete a Waypoint from the list, enter in the desired Waypoint as like to edit it ( key), then press the key  (long press) and confirm the delete request pressing the  key, or cancel the procedure using the  key.
- To delete all the Waypoints of a list: while you are inside a WP list press the  key (long press), and confirm the delete request of ALL THE WP with the  key, or cancel the procedure using the  key

8 NAVIGATE TO A SINGLE WAYPOINT (GOTO)

8.1 ACTIVATING NAVIGATION TO A WAYPOINT (GOTO)

8.1.1 NAVIGATION TO WAYPOINT HOME (GOTO HOME)

- Available only in the **GPS INFO** page, ensures that the instrument guides us back to the point where we activated this function.

It's particular useful, for example, when we go flying in a new site of which we don't have waypoints and we want to get guided to the landing zone . In this case is necessary to go to the landing zone and activate this function.

How to activate the "**GOTO HOME**" function : from the **GPS INFO** page, wait till the GPS position is valid, then press the  key (long press) , the message " Activate Home Wpt ?" is shown, press the  key to confirm or press the  key to annul.

Note : if a navigation has already been previously activated, first of all is necessary to deactivate it : from the **GPS INFO** page press the  key (long press) , the message " Clear Nav ?" is shown, press the  key to confirm or press the  key to annul.

The "**GOTO HOME**" function creates a landing waypoint in the User Waypoint list ("WPT USER") with the current position data "HOMaaa" (aaa = GPS altitude in tens of meters) and with the icon "A" (airfield) and at the same time activates the navigation (GOTO) to it

8.1.2 NAVIGATION TO THE NEAREST LANDING ZONE (GOTO LANDING)

- To activate this function wait till the GPS position is valid, enter in the menu with the  key, select the sub-menu "Wpt Near Airfield".
- In it there is a list of all the landing fields get from both the WP database (USER+COMP) having the symbol "A" .
- This list is sorted from the nearest landing zone first and the distance from the current GPS position,
- The cursor is automatically set on the nearest landing. If necessary scroll the list using the arrow keys  and  . To select the required zone, press the  key (long press) then confirm the choice to activate the navigation to the WP pressing again the  key, or cancel the procedure using the  key.

8.1.3 NAVIGATION TO THE NEAREST WAYPOINT (GOTO NEAREST)

- To activate this function wait till the GPS position is valid, enter in the menu with the  key, select the sub-menu "Wpt Nearest".
- In it there is a list of all the nearest waypoints obtained from both USER & COMP database.

- The cursor is automatically set on the nearest Waypoint, if necessary scroll the list using the arrow keys  and . To select the required waypoint, press the  key (long press) then confirm the choice to activate the navigation to the WP pressing again the  key, or cancel the procedure using the  key.

8.1.4 NAVIGATION TO A GENERIC WAYPOINT (GOTO)

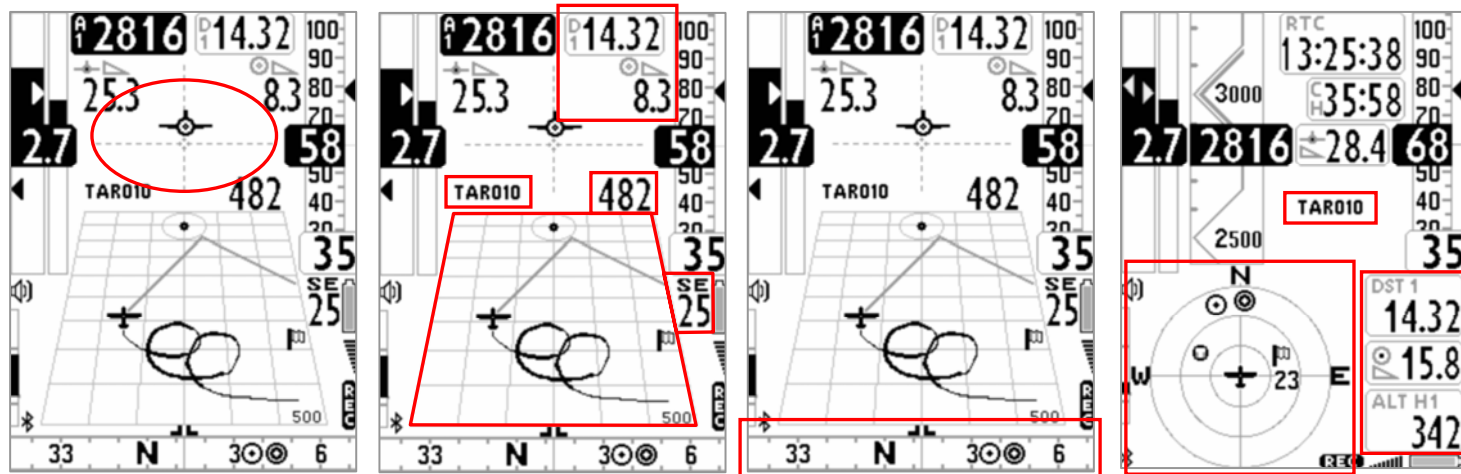
- To activate this function wait till the GPS position is valid, enter in the menu with the key , select the database Waypoint, "Competition" or Waypoint User", accordingly where is recorded the chosen WP.
- Scroll the list using the arrow keys ,  and set the cursor on the wished Waypoint, to select it press the  key (long press) then confirm the choice to activate the navigation to the WP pressing again the  key, or cancel the procedure using the  key.

8.1.5 DEACTIVATING NAVIGATION TO A WAYPOINT (GOTO)

- To deactivate the current navigation, from the **GPS INFO** page, press the  key (long press) , the message "Clear Nav ?" is shown, press the  key to confirm or press the  key to annul.

8.2 NAVIGATION'S FUNCTIONS TO A SINGLE WAYPOINT (GOTO)

The following navigation's functions are available only if a navigation toward a single waypoint (GOTO) is active :



8.2.1 DIRECTION, DISTANCE, HEIGHT TO THE CURRENT WAYPOINT (GOTO)

- **BRG 1 (B1)** : is the direction to the current Waypoint. Even shown on compass with this icon



and with "follow me" simbol



- **DST 1 (D1)** : is the distance to the current Waypoint

It is possible to set the distance's unit of measure using the parameter (**MAIN SETUP \ n. 16 U-SP**) the same used also for the speed value.

- **ALT H1 (H1)** : is the estimated height of arrival above the current Waypoint.

This height is computed integrating the following info: Altimeter A1, distance to the Waypoint "DST1" , Waypoint altitude and average glide ratio.

The average glide ratio is continuously update during the glide and stored in the memory during the thermal flight. To change the average time (seconds) use the parameter (**ADVANCED SETUP \ n. 8 EFFA**).

The Waypoint's altitude have to be included in the Waypoint's name:

- o aaaNNN visible on the bottom of the waypoint's page.
- o aaa = 3 alphanumeric characters for the Waypoint's name.
- o NNN = waypoint altitude above sea level, in tens of meters. Note: if the field NNN doesn't contain three numbers, then the navigation uses the Altitude field.

BRG 1
45

DST 1
14.32

ALT H1
342

8.2.2 NEEDED GLIDE RATIO TO THE CURRENT WAYPOINT (GOTO)

- It is the estimated requested glide ratio to reach the current Waypoint.

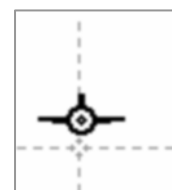
15.8

8.2.3 ARRIVAL HOUR, ARRIVAL TIME TO THE CURRENT WAYPOINT (GOTO)

- It is the expected arrival hour "**TIM1 (T1)**" and the expected arrival time "**ETIM1 (E1)**" to the current Waypoint

8.2.4 HSI GRAPHIC INDICATION TO THE CURRENT WAYPOINT (GOTO)

- HSI is a graphical navigation tool made by two dashed lines that intersect each other indicating the current WPT and its real height. Flying towards the center of the WPT cylinder, the airplane icon moves right or left of the dashed vertical line in case of wrong route and up or down the dashed horizontal line telling us the arrival height with the current gliding ratio.



9 ROUTE MANAGEMENT

9.1 ROUTES OVERVIEW

- From the main menu enter in the sub menu "ROUTES".
- The first visualized route is the "Rt 1 ", to select other routes use the arrow keys  (long press) or  (long press).
- It is possible to memorize up to 12 routes from "Rt 1" to "Rt 12" containing each one up to 20 Waypoints
- A route allows to automatically navigate toward the last WP going through all the inserted WP. On the bottom of the route screen is visualized the route's total distance in km.
- For every route it is possible to insert both Waypoint Competition and Waypoint User in any combination.
- The routes can be created manually or can be uploaded from PC using the software Digifly AirTools.
- In the page route is also listed the total distance of the route in km "Tot dst km".

Rt 01		1.04
04M011	S	001400
01M031	A	000400
03M009		000400
01M031	A	000400

OUT	Start	15 : 02
Next Gate		15 min
Tot. Gates		1
Altitude		0110 mt
Tot dst m		035763

9.2 VISUALIZING WAYPOINT DATA OF A ROUTE

- Using the arrow keys ,  set the cursor on the desired waypoint's line.
- Press the  key to open the drop down menu containing the possible action, then select "EDIT - VIEW" and confirm with the  key.
- Press the  key to go back the route's page.

9.3 INSERT A WAYPOINT IN A ROUTE

- Using the arrows keys ,  set the cursor on the desired waypoint's line where you want to insert another Waypoint
- Press the  key to open the drop down menu containing the possible action, then select "INSERT WPT xxxxxx" and confirm with the  key.
- From the Waypoints list select the desired one and confirm with the  key.

9.4 SUBSTITUTE A WAYPOINT IN A ROUTE

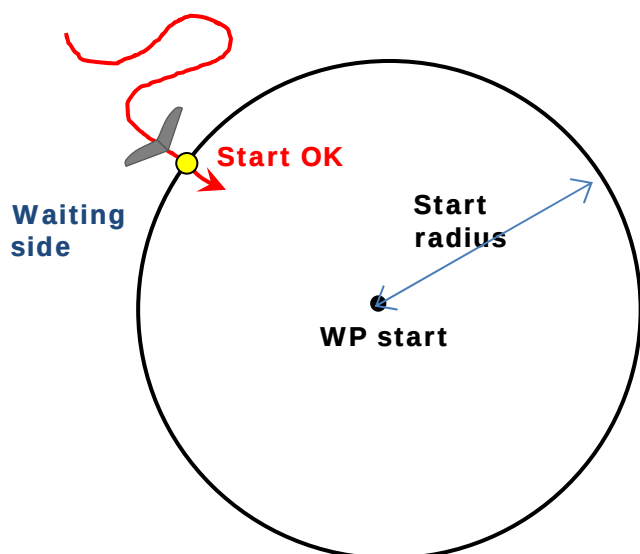
- Using the arrows keys ,  set the cursor on the desired waypoint's line where you want to substitute an existing Waypoint.
- Press the  key to open the drop down menu containing the possible action, then select "CHANGE WPT xxxxxx" and confirm with the  key.
- From the Waypoints list select the desired one and confirm with the  key.

9.5 MODIFY A WAYPOINT IN A ROUTE (PARAMETER CHANGE)

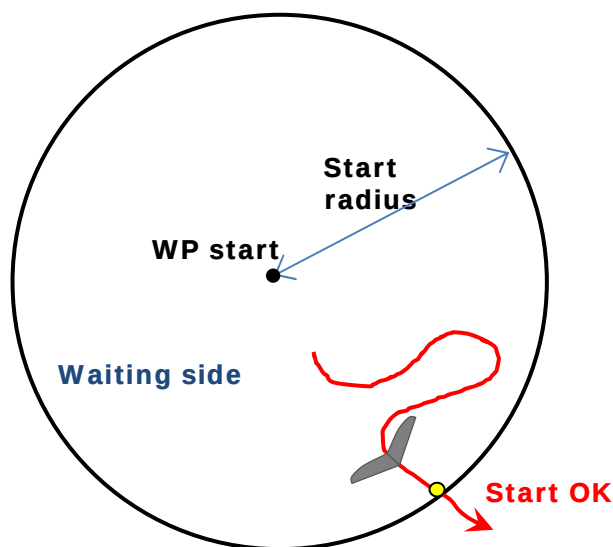
- A Waypoint added to a route needs to be changed if you want it to become the "start pylon" WPT (**Wpt Type = IN/OUT**) you need to change even the radius of cylinder validation (**Radius**).
- Press the key ,  set the cursor on the desired waypoint's line that you want to modify.
- Press the  key to open the drop down menu containing the possible action, then select "EDIT - VIEW" and confirm with the  key.
- It appears a page with all the Waypoint data, use the arrow keys ,  to navigate the field you want to modify and confirm with the  key.
- The function "EDIT" is described in the chapters 2.6.1 and 2.6.2.
- The waypoint fields that have generally to be EDITED in a route are:
 - o **Sym** : number from **0** to **9** or the letter **A** to identify a landing field (Airfield).
 - o **Note** : alphanumerical, 16 characters
 - o **Near** : distance in meters from the cylinder where it is activated the one second oversample of the flight recorder.
 - o **Radius** : radius in meters of the turn point cylinder
 - o **Wpt Type** : "----" = normal type (default) , "REV" = reverse type , "IN" = Start Pylon entering, OUT = Start Pylon leaving
 - o **Start Gate Time** : time of the first start (hours:min)
 - o **Next Gate** : time to the next start (minutes)
 - o **N. Gates** : total number of Start gate
 - o **Aux** : not used
- Press the  key to go back to the route's page

Name	Sym
0 4 M 0 1 1	
START	
Lat Lon ddmms.ss	
44 29' 08.1N	
011 16' 59.9E	
Altitude	0110 m
Near	0100
Radius	01400
OUT Start	15 : 02
NextGate	15 min
N.Gates	1
Aux	0

ENTERING START PYLON (IN)



LEAVING START PYLON (OUT)



9.6 DELETE A WAYPOINT IN A ROUTE

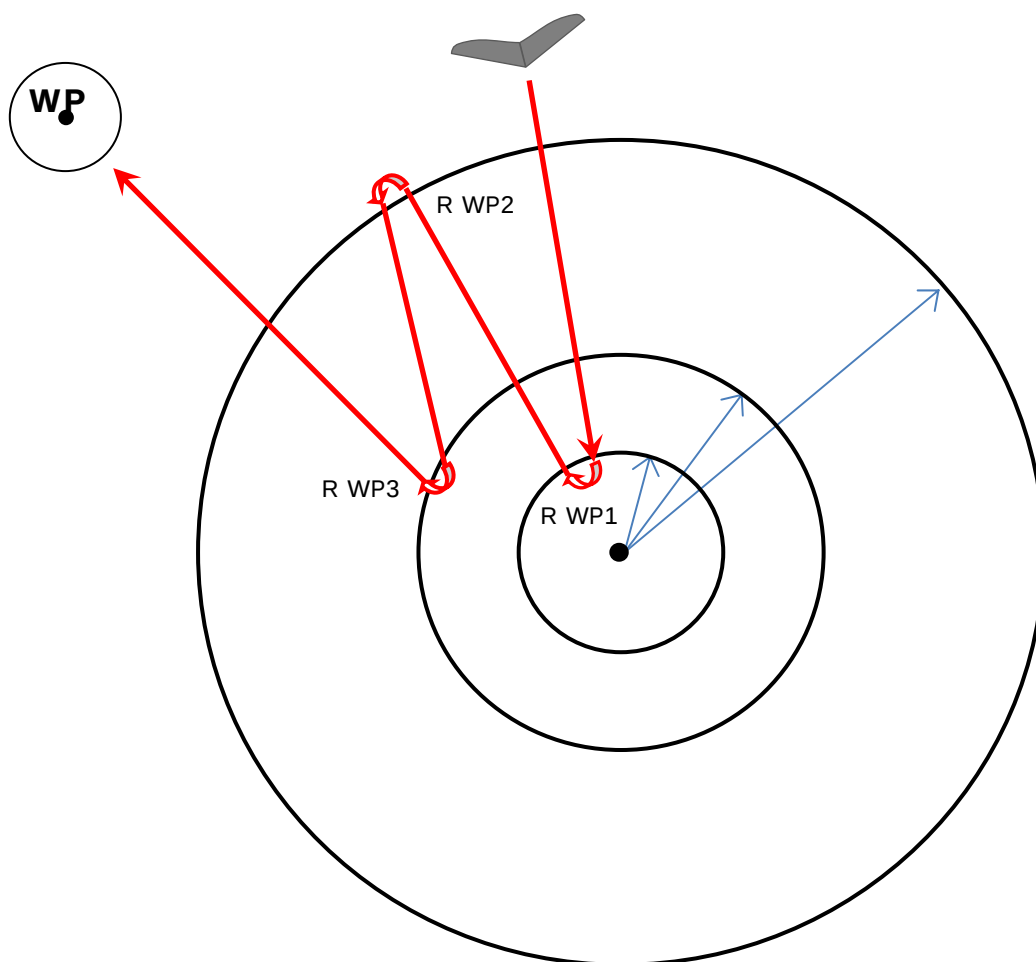
- Using the arrows keys ,  set the cursor on the waypoint to be deleted.
- Press the  key to open the drop down menu containing the possible action, then select “DELETE”, confirm with the  key, or cancel the procedure using the  key.
- Confirm to accept the cancellation of the WP pressing the  key, or cancel the procedure using the  key.

9.7 DELETING A ROUTE

- To delete a route from the **Menu Routes** enter into the route to be activated and press the  key (long press) and confirm with the  key, or cancel the procedure using the  key.

9.8 NAVIGATION TO CONCENTRIC WAYPOINT

- To properly manage a task's route with concentric waypoints it is necessary to insert in the desired position of the route the same waypoint three times, accordingly to the task route, but with different cylinders radius and to set the outer Waypoint parameter **Wpt Type** = "REV" (reverse type) (the waypoint WP2 in this example) .



10 ROUTE NAVIGATION

To have these info available it has to be activated a route's navigation.

10.1 ACTIVATING A ROUTE

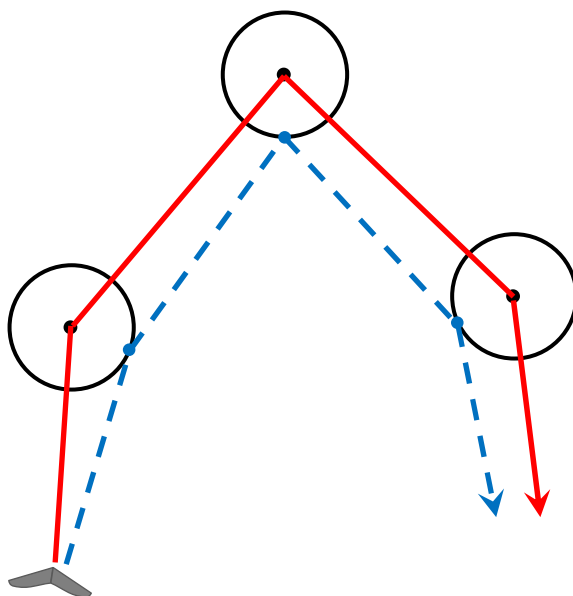
- To activate a route, from the **Menu Routes** enter into the route to be activated and press the  key (long press) , the message " Activate Route Nav ?" is shown, press the  key to confirm or press the  key to annul.

10.2 DE-ACTIVATING A ROUTE

- To deactivate a route, from the **GPS INFO** page, press the  key (long press) , the message "Clear Nav ?" is shown, press the  key to confirm or press the  key to annul.

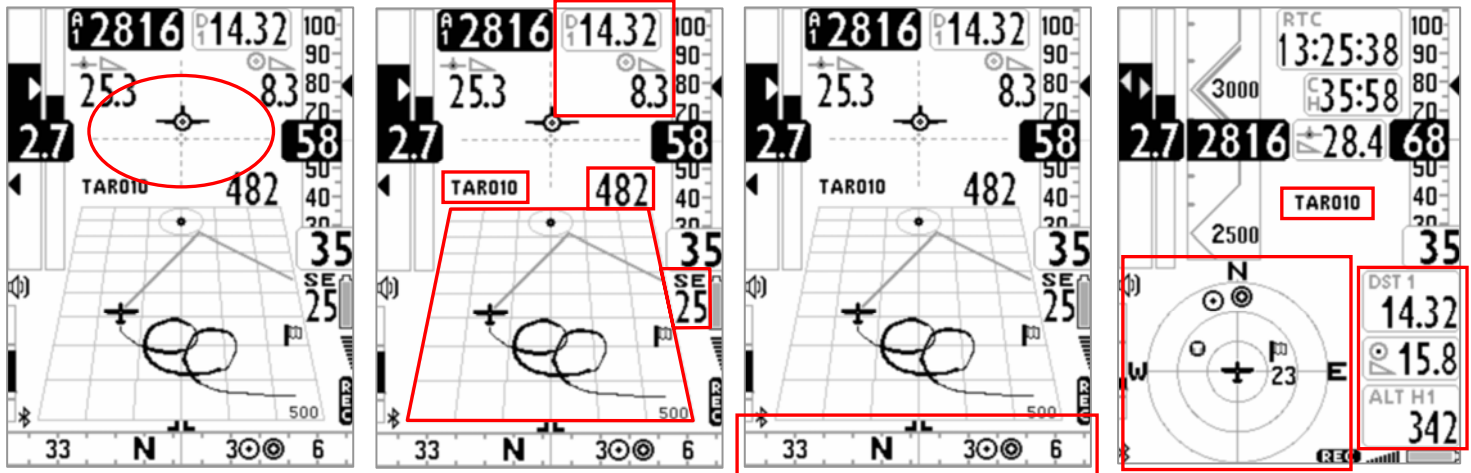
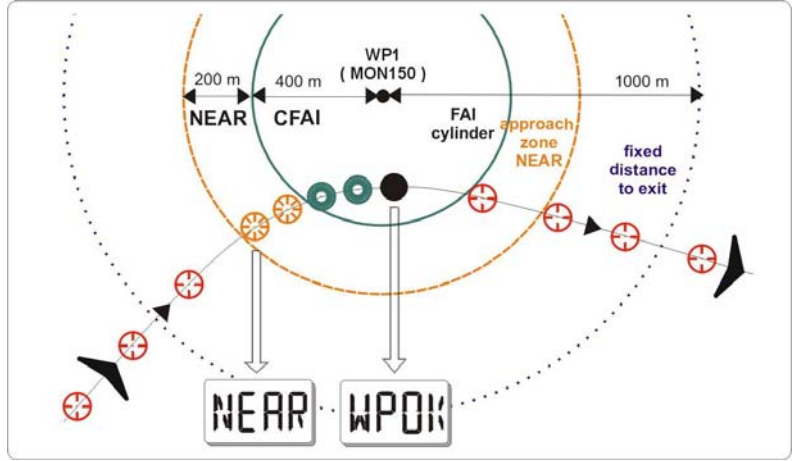
10.3 OPTIMIZED NAVIGATION

- The optimized navigation is always activated and calculated in real time , it shows to the pilot the shortest path along the task's route:



10.4 NAVIGATION TO STANDARD WAYPOINT

- If the current Waypoint is **not** set as a start pylon, the navigation is managed in 'standard cylinder mode' and the Digifly Air will drive you providing constant info about your position, distance, direction, required glide ratio and expected arrival height above the current Waypoint cylinder and to the arrival Waypoint cylinder.
- When you arrive near the Waypoint cylinder the flight recorder rate is automatically set to one data point per second. The parameter "NEAR" can be modified from the page Waypoint's edit.
- Cylinder validation: entering in a cylinder the Digifly air will alert you with a sound and will appear the message "WPOK" or the message "TASK FINISHED" if it is the arrival Waypoint then flight recorder rate returns to the setup value (MAIN SETUP \ n. 5 RECR).
- If the navigation is activated the following functions are available :



10.4.1 DIRECTION, DISTANCE AND HEIGHT over CURRENT WAYPOINT

- BRG 1 (B1)** Shows direction to current cylinder waypoint along the optimized route. Its shown

with this icon  on compass and with icon  "follow me"

BRG 1
45

- DST 1 (D1) :** Shows distance to current cylinder waypoint along the optimized route.

It is possible to set the distance's unit of measure using the parameter (MAIN SETUP \ n. 16 U-SP) the same used also for the speed value.

DST 1
14.32

- ALT H1 (H1) :** Shows estimated arrival height to current cylinder waypoint along the optimized route.

this height is calculated as follows: Alti A1, distance to current cylinder waypoint DST 1, height current Waypoint and average efficiency.

ALT H1
342

Average efficiency is updated in real time while gliding and stored while thermaling , to change value of refresh (in seconds) modify parameter (ADVANCED SETUP \ n. 8 EFFA).

Height of waypoint as to be included in its name:

- o aaaNNN visible in the bottom of waypoint page.
- o aaa = 3 alphanumeric character for waypoint name.
- o NNN = height of waypoint over sea level, in tens of meters , N.B. if there is no value setted, navigation will use height value field.

- **BRG 0 (BO)** : shows direction to nearest point of current waypoint cylinder. Also shown with  icon on compass
- **DST 0 (DO)** : shows distance to nearest point of current waypoint cylinder

BRG 0
35

DST 0
14.22

10.4.2 NEEDED GLIDE RATIO TO CURRENT WAYPOINT

- It is the estimated needed glide ratio to reach the current Waypoint's cylinder along the optimized route

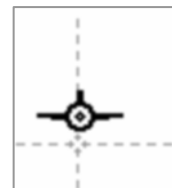
 15.8

10.4.3 ARRIVAL TIME, TIME TO CURRENT WAYPOINT

- Shows estimated arrival time "**TIM1 (T1)**" and how much time is missing to estimated arrival time "**ETIM1 (E1)**" to get to current cylinder waypoint along optimized route.

10.4.4 HSI GRAPHIC NAVIGATION TO CURRENT WAYPOINT

- HSI is a graphical navigation tool made by two dashed lines that intersect each other indicating the current WPT and its real height. Flying towards the center of the WPT cylinder, the airplane icon moves right or left of the dashed vertical line in case of wrong route and up or down the dashed horizontal line telling us the arrival height with the current gliding ratio.



10.4.5 DISTANCE AND HEIGHT over THE GOAL

- **DST A (DA)** : Shows distance to arrival Waypoint (goal) along optimized route
- **ALT HA (HA)** : Shows estimated height to arrival Waypoint (goal) along optimized route. This height is calculated as follows: Alti A1, distance to arrival waypoint (goal) DST A, height arrival waypoint (goal) ALT HA and average efficiency.

DST A
44.52

ALT HA
58

10.4.6 NEEDED GLIDE RATIO TO THE GOAL

- It is the estimated needed glide ratio to reach the Goal 's cylinder along the optimized route.

 28.4

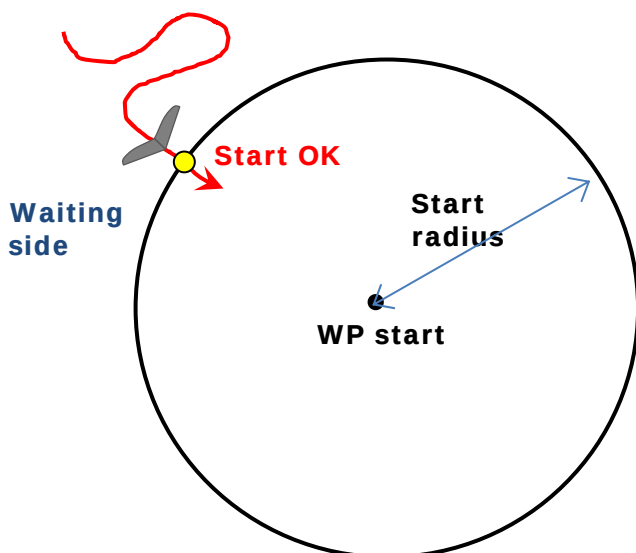
10.4.7 ARRIVAL TIME, TIME TO THE GOAL

- Shows estimated arrival time "**TIM A (TA)**" and how much time is missing to estimated arrival time "**ETIM A (EA)**" to get to arrival cylinder waypoint along optimized route.

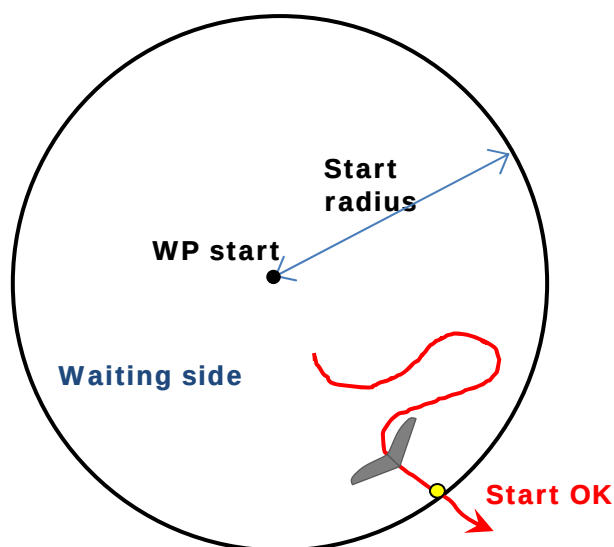
10.5 NAVIGATION TO START PYLON WAYPOINT

- The current Waypoint is managed as a Start Pylon only if its parameter **Wpt Type** has the value **"IN"** (Entering Start Pylon) or the value **"OUT"** (Leaving Start Pylon). See 9.5 for more details about the **Wpt Type** setting.
- If current waypoint is the start pylon, the instrument automatically replaces waypoint name, graphical HSI (or graphical altimeter) with a set of instruments to manage it:
 - the "name waypoint" value if viewed in current layout is automatically replaced with **ESTART (ES)** that shows estimated time arrival to the border of start pylon .
 - Graphical HSI or graphical altimeter if viewed in current layout is automatically replaced with a group of three instruments : **CSTART (CS)** time missing (countdown) to start opening, **STS (SS)** required speed necessary to get to start line on opening time, and direction icon **"follow me"** .
- When 10 minutes are missing to start time, a message appears on monitor **"10 MIN TO GO !"** followed by a double beep.
- When time to start is **00:00** a message appears on monitor **"GATE OPENED"** followed by a double beep, telling the pilot that gate is opened, now he can go through start pylon (IN or OUT depending on function option chosen).
- In case you go through the start pylon before the gate is opened, the value of distance to line start is shown in reverse mode (white on black background) so that you know you're on the wrong side of the circle.
- The instrument guides us constantly towards the border of "start pylon", until it doesn't get crossed on the right side when gate is opened; when this happens a message appears **"WP OK"** followed by a bitonal sound, the chrono is set on time already passed since start and navigator shows next waypoint.
- **IN** = start validation entering waypoint **OUT** = start validation outgoing waypoint.

ENTERING START PYLON (IN)



LEAVING START PYLON (OUT)



10.5.1 STARTING TIME (TSTART)

- TSTART : Shows start time since gate is been opened



10.5.2 REMAINING TIME TO START (CSTART)

- CSTART (CS) : shows time missing (countdown) to start opening



10.5.3 EXPECTED ARRIVAL TIME TO START LINE (ESTART)

- ESTART (ES) : Shows estimated arrival time to the border of start pylon based on average speed relatively to countdown. If the instrument indicates "00:10", written in black on white background, means that the pilot will get to start line with a delay of 10 seconds, if its written "00:15 " in reverse mode (white on black background) means that the pilot will get to start line 15 seconds ahead time (penalty).



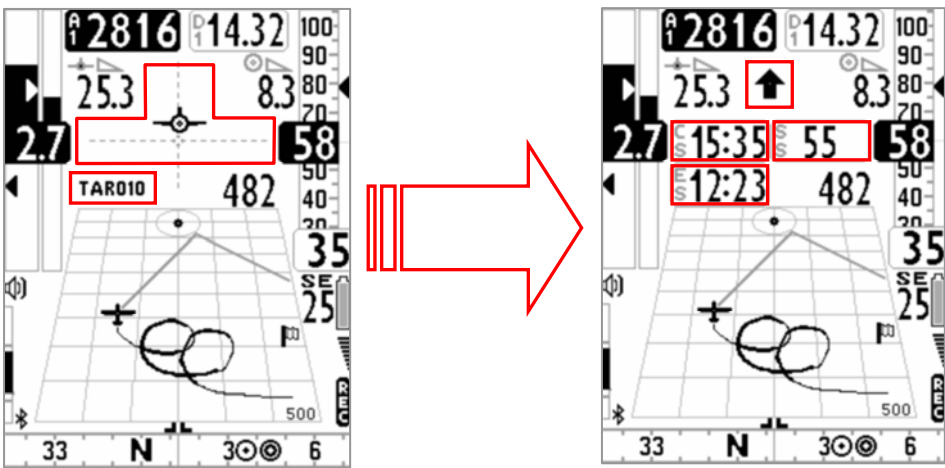
10.5.4 REQUIRED SPEED NEEDED TO START LINE (STS)

- STS (SS) : shows required speed to get to start line on opening gate time.



10.5.5 START PILON INSTRUMENTS AUTOMATIC SWITCH (PLOTTER PAGE)

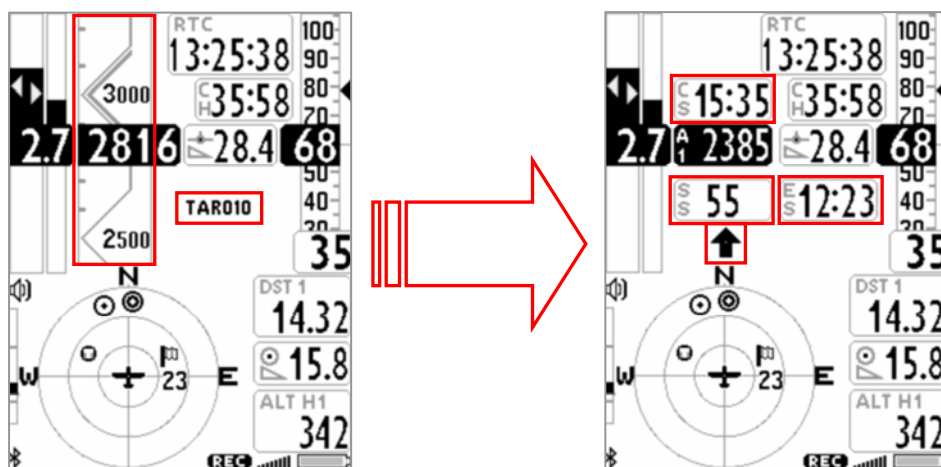
- In the plotter page when current waypoint is the start pylon, the instrument automatically replaces waypoint name, graphical HSI (or graphical altimeter) with a set of instruments to manage it:
 - the "name waypoint" value if viewed in current layout is automatically replaced with **ESTART (ES)** that shows estimated arrival time to the border of start pylon .
 - Graphical HSI or graphical altimeter if viewed in current layout is automatically replaced with a group of three instruments : **CSTART (CS)** time missing (countdown) to start opening, **STS (SS)** required speed necessary to get to start line on opening time, and direction icon "follow me" .



10.5.6 START PILON INSTRUMENTS AUTOMATIC SWITCH (COMPASS PAGE)

- In the compass page when current waypoint is the start pylon, the instrument automatically replaces waypoint name, graphical HSI (or graphical altimeter) with a set of instruments to manage it:
 - the “name waypoint” is automatically replaced with **ESTART (ES)** that shows estimated arrival time to the border of start pylon.
 - Graphical HSI or graphical altimeter is automatically replaced with a group of three instruments : **CSTART (CS)** time missing (countdown) to start opening, **STS (SS)** required speed necessary to get to start line on opening time, and direction icon

"follow me"



10.6 OPERATION CHECKLIST BEFORE A TASK

- Be sure that batteries are fully charged
- Download the waypoints from the competition organization web site
- Upload them on the Digifly Air with the software AirTools (PC, MAC) or GpsDump (PC , MAC, SMARTPHONE)
- Edit the route accordingly to the task's director instruction :
 - o Insert the turn points cylinders radius
 - o Insert correctly the Start Pylon type using the parameter **Wpt Type** : set the value "IN" (Entering Start Pylon) or the value "OUT" (Leaving Start Pylon). See 9.5 for more details about the **Wpt Type** settings.
 - o Insert correctly the start time
 - o If existing, insert also the ulterior gate time (how may and when)
 - o In the route page verify that the total distance is corresponding ("Tot dst m") , calcolata dal centro del primo wpt al centro dell' ultimo wpt lungo la rotta non ottimizzata
- Activate the route
- Set the barometric altimeter A1, this is important as it is used also by the glide's computer.
- Before takeoff, turn on your instrument with sufficient time to allow a correct GPS position to be obtained.
- After the GPS position has been obtained, check that the time is correct. If necessary change the time zone otherwise the start time will be wrong. Parameter (**MAIN SETUP \ n. 7 UTC0**)

11 FLIGHT RECORDER



- When the Digifly Air starts the flight recorder, it shows the message “REC ON” and the icon “rec” on the bottom of the display starts blinking. The following parameters are continuously recorded: Date and time, latitude, longitude, number of satellites, tracking GPS, ground speed GPS, altimeter GPS, barometric altimeter A1, variometer and anemometer.
- **IMPORTANT: while in menu no data are recorded.**

11.1 ACTIVATING / DE-ACTIVATING FLIGHT RECORDER

- The flight recorder can operate in three different ways:
 - “AUT” Automatic flight recorder.
 - “ALW” Flight recorder always active
 - “OFF” Flight recorder deactivated.

11.1.1 AUTOMATIC START RECORD MODE “AUT”

- By default setting, the flight recorder starts automatically, **MAIN SETUP \ n. 3 RECM = AUT**
- The flight recorder activates automatically only if it is available the GPS position and it is detected a takeoff with an altitude variation of at least 0,5m (**MAIN SETUP \ n. 4 R.DS = 0,5**) and a Ground Speed (GPS) higher than 6km/h for 3 consecutive seconds (**MAIN SETUP \ n. 5 R.TI = 3**).
- The flight recorder is automatically deactivated 60 second after the landing or if the instrument is turned off.

11.1.2 ALWAYS ACTIVE RECORD MODE “ALW”

- To set the "always active" record mode set the parameter (**MAIN SETUP \ n. 3 RECM = ALW**). The flight recorder is activated once the instrument is turned on and is deactivated when it is turned off.

11.1.3 RECORD MODE OFF “OFF”

- To deactivate the flight recorder set the parameter (**MAIN SETUP \ n. 3 RECM = OFF**), no data are recorded.

11.2 RECORD RATE

- The recorder rate can be adjusted from 1 to 60 seconds, go to (**MAIN SETUP \ n. 6 RECR**).
- setting 1 data point per second you can record over 30 hours of flight data.
- Setting 1 data point per minute, you can record up to 1800 hours of flight data.
- The recorder memory has room for up to 100,000 GPS data point and up to 250 flights.
- When you are near a Waypoint, the recorder rate is automatically increased to 1 data point per second.
- When the recorder's memory is full, the oldest flight is automatically deleted by the newest one.
- The remaining free memory time and percentage are shown for 2 seconds as the instrument is turned on
- If a single flight fills the whole memory, it is no more possible to use the recorder. A message “MEM FULL” appears every time that you try to use it. To activate again the flight recorder it is necessary to clear the whole recorder memory. To do this: from the menu “LOGBOOK press the key  (long press) and confirm the cancellation of ALL THE FLIGHTS pressing the key , or cancel the procedure using the key .

11.3 LOG BOOK MANAGEMENT (LOG BOOK)

- To see the recorded flights select the menu “LOGBOOK”. It appears the list of all the recorded flights with the date and take off time.
- To see details of each flight recorded, after selection of the flight press the key .
 - o For every flight are shown the following information:
 - o Take off date and time, flight duration, and total altitude gain.
 - o Max and min values for : Altimeter (A1) and Variometer
 - o Max values for : Ground speed GPS and Indicated Air Speed (IAS)
- To delete all the flights of a list: from the menu “LOGBOOK press the key  (long press) and confirm the cancellation of ALL THE FLIGHTS pressing the key , or cancel the procedure using the key ..
- It is not possible to delete a single flight.

12 ADDITIONAL MEMORY CARD

- In the vario case, aside to the micro USB connector, it is possible to insert a Micro SD memory card of 2 GB maximum capacity.
- To insert a memory card, place the card with the label toward the instrument's keyboard side and insert the connector card's side inside the instrument, to lock the memory card it is necessary to gently press it with your fingernails untill it will be locked in the case.
- To extract the memory card press it in to release it.
- Warning: if the card is incorrectly inserted, it is possible that the instrument would be damaged



13 CONNECTIONS & INTERFACES

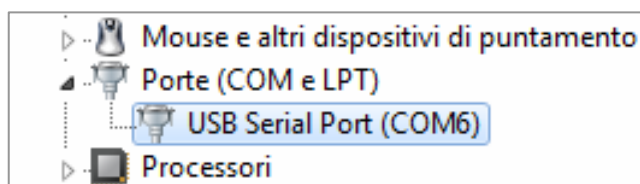
- It is possible to connect your Digifly AIR-SE and AIR-BT to a PC, MAC, Smartphone, Tablet , PDA using the provided USB cable. The Digifly AIR-BT allows also the connection via Bluetooth.

13.1 USB CABLE CONNECTION

- To use the USB connection the installation of the FTDI USB Cable Driver on your PC/MAC is required.
- USB cable driver automatic installation** (only with internet connection) :
Connect the USB cable to the PC/MAC and to the instrument, usually the operative system download and install the FTDI driver automatically.
- USB cable driver manual installation** : if the automatic installation was not successful the manual installation of the FTDI driver is then required :
 - disconnect the USB cable from the PC/MAC and from the instrument
 - download the proper driver installation program accordingly to the PC/MAC in use from www.digifly.com-> download -> FTDI USB Cable Driver
 - unzip the downloaded files in a new folder and run the driver installation program
 - restart the PC/MAC
 - reconnect the USB cable to the PC/MAC and to the instrument

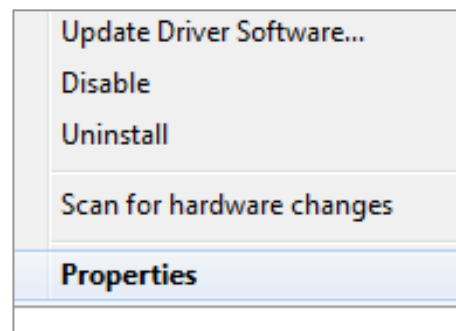
- Verify proper installation of the USB cable driver :**

- connect the USB cable to the PC/MAC
- from Windows7 Start menu go to Control Panel -> System and Security -> System -> Device Management
- click on the sign (+) nearby "Ports (COM e LPT)".



- if the driver is correctly installed it is shown the message "USB Serial Port (COMxx)" without any yellow indication of error. Note: that 'x' is the number of the COM port assigned to the PC USB.

- The driver type is visible with a mouse's right key click on "USB Serial Port" then click on "Properties", if the driver is installed it will show "FTDI".

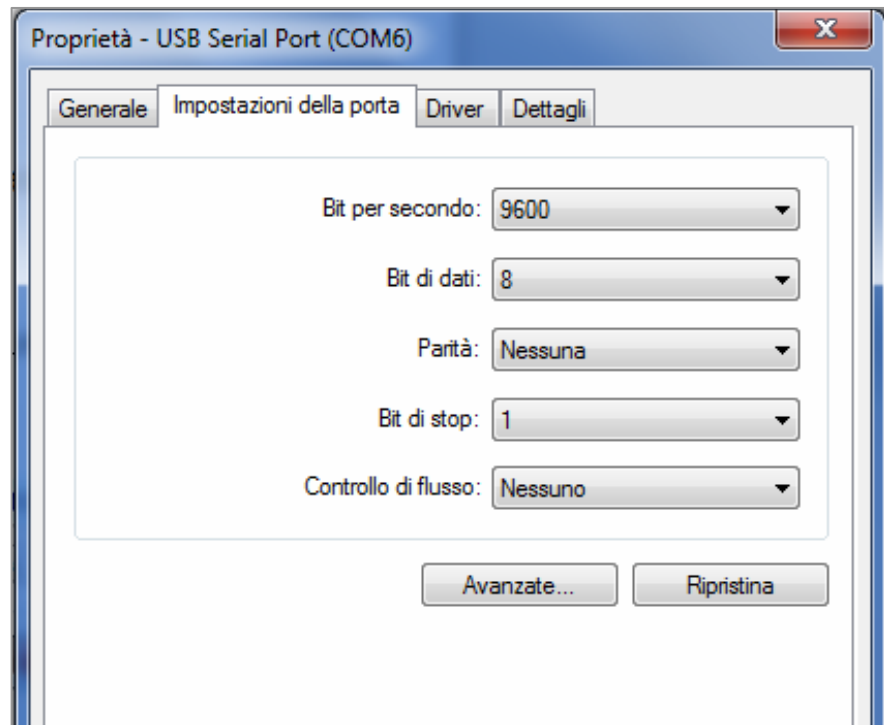


- How to manually reassign the COM port number :**

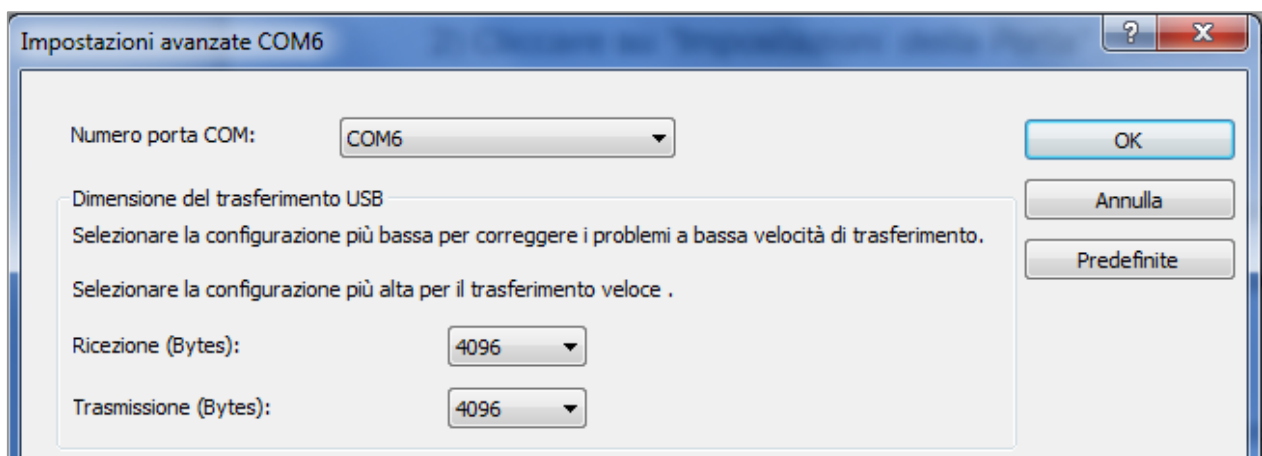
All Digifly software perform the automatic search of the COM port number in the range 1 to 20, a third-party software in most cases require that the COM port is in the range from 1 to 9.

If the COM port assigned by the computer has a higher number is necessary to manually reassign it this way :

- connect the USB cable to the PC/MAC
- right click on "USB Serial Port" then click on "Properties"
- click on "Port settings" then click on "Advanced"



- In the "Advanced Settings" window set the "COM Port Number" with the lowest number (from 1 to 9) among the ports that aren't already in use, then click "OK"



- Note: If the value displayed in the "Device Manager" window is still the old one, refresh the display value by closing and reopening this window
 - Take note of the COM port number, to be used later to manually set the correct port number of third-party software (eg GPSDump).
- Please note that all Digify software have automatic detection of the COM port number and therefore do not need this setting

13.2 BLUETOOTH CONNECTION (AIR-BT ONLY)

13.2.1 BLUETOOTH "PAIRING"

- The communication via Bluetooth between Digifly AIR-BT and an external device (PC, MAC, SmartPhone, Tablet or PDA) is possible only after the coupling (pairing) between the two devices, here is how to proceed :
 - 1) Set on the **AIR-BT** the parameter (ADVANCED SETUP \ n. 24 BLUT = "ON")
 - 2) in the **AIR-BT**, enter in the menu "AirTools"
 - 3) you are prompted to choose whether to communicate via USB cable or via Bluetooth with the message "Press OK to link USB, Press DOWN to link BT or Menu to exit", press the  key (communication via Bluetooth)
 - 4) **AIR-BT** looks forward to the pairing request from the external device
 - 5) from the control panel of the Bluetooth external device panel, press the 'option "Search"
 - 6) a list of available devices is created, click on "Digifly AIR BT"
 - 7) when prompted, enter the pairing code of the AIR-BT which is "0000" and then confirm; if the procedure is successful, the external device displays a message to confirm that the Digifly AIR BT is paired
- From now on, to communicate with each other these two devices is no longer necessary to repeat the pairing.
- In case of problems, to exit press the  key on the **AIR-BT**.

13.2.2 BLUETOOTH COMMUNICATION WITH MANAGEMENT SOFTWARE OF THE INSTRUMENT

- The management software of the AIR-BT that over USB cable can also communicate via Bluetooth are : Digifly AirTools, Digifly AirPageConfigurator and GPSDump.

In order to use these software you must have already previously done (only once) the pairing procedure with the external device (see 13.2.1). It also requires that the parameter (ADVANCED SETUP \ n. 24 BLUT) is set to "ON" (Bluetooth enabled).

The sequence of operations for using these software via Bluetooth is the following:

- 1) in the **AIR-BT**, enter in the menu "AirTools"
 - 2) you are prompted to choose whether to communicate via USB cable or via Bluetooth with the message "Press OK to link USB, Press DOWN to link BT or Menu to exit", press the  key (communication via Bluetooth)
 - 3) run the software on the external device (eg GPSDump for Android Smartphone)
 - 4) when the **AIR-BT** starts to receive commands from the external device it displays the blinking message "Link BT"
- In case of problems, to exit press the  key on the **AIR-BT**.

13.2.3 BLUETOOTH COMMUNICATION WITH SOFTWARE DECODING THE DIGIFLY TELEMETRY

- Software that can receive, decode and display the Digifly telemetry data sent in real time at high speed from the AIR-BT via Bluetooth are XCSoar and LK8000.

In order to use these software you must have already previously done (only once) the pairing procedure with the external device (see 13.2.1). It also requires that the parameter (ADVANCED SETUP \ n. 24 BLUT) is set to "ON" (Bluetooth enabled) and that the parameter (ADVANCED SETUP \ n. 23 TELE) is set to "FL2" (sending Digifly

telemetry data enabled).

The sequence of operations for using these software via Bluetooth is the following:

- 1) in the **AIR-BT**, enter in the menu "**Telemetry BT**"
- 2) run the software on the external device (eg XCSOAR on Android Smartphone)
- 3) when AIR-BT receives from the external device the confirmation of connection it automatically exits from the "Telemetry BT" menu, returns on the current page of instruments, turn on the Bluetooth icon and activate the continuous transmission of real-time Digifly telemetry data at high speed

- In case of problems, to exit press the  key on the **AIR-BT**.

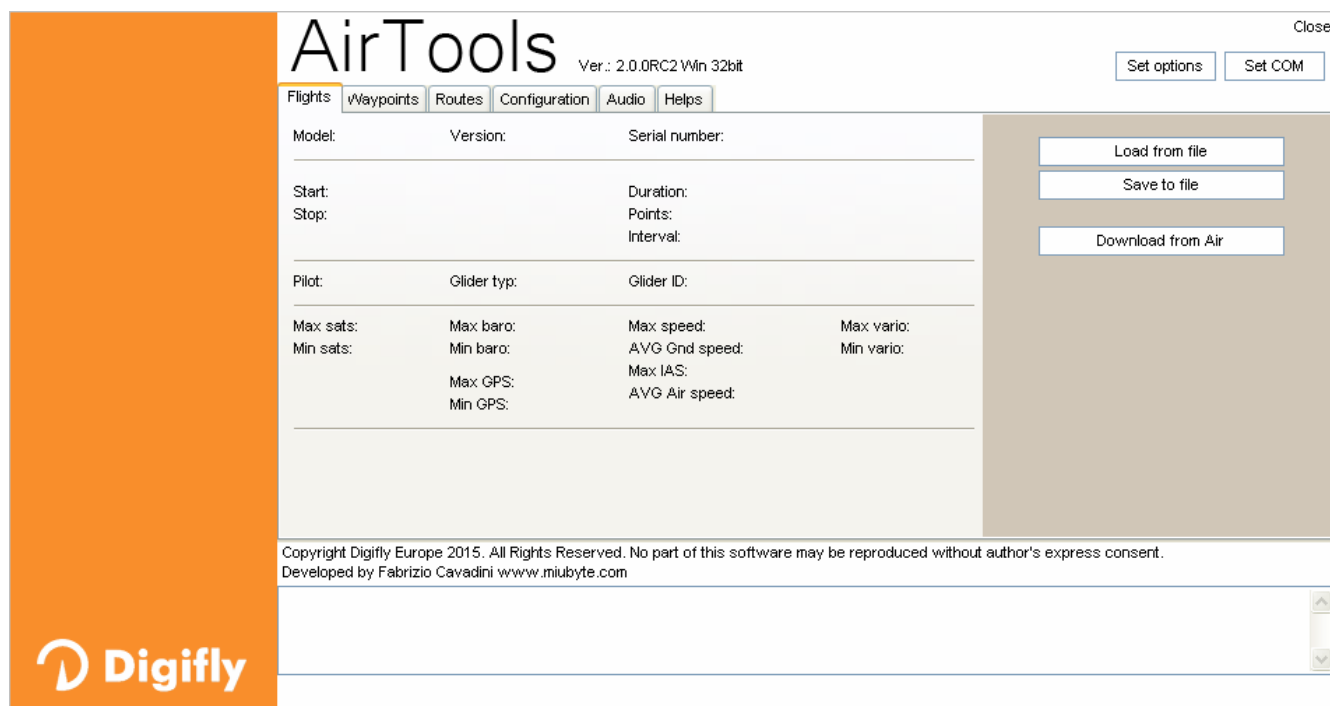
14 SOFTWARE

14.1 AIR MANAGEMENT SOFTWARE

- Your Digifly Air uses the Digifly protocol, this protocol allows to communicate at high speed with the applications having it embedded in their interface (e.g. Digifly AirTools, Digifly AirPagesConfigurator, GpsDump). Thanks to this protocol it is possible to access & configure your vario remotely.
Important : always run only one program at a time

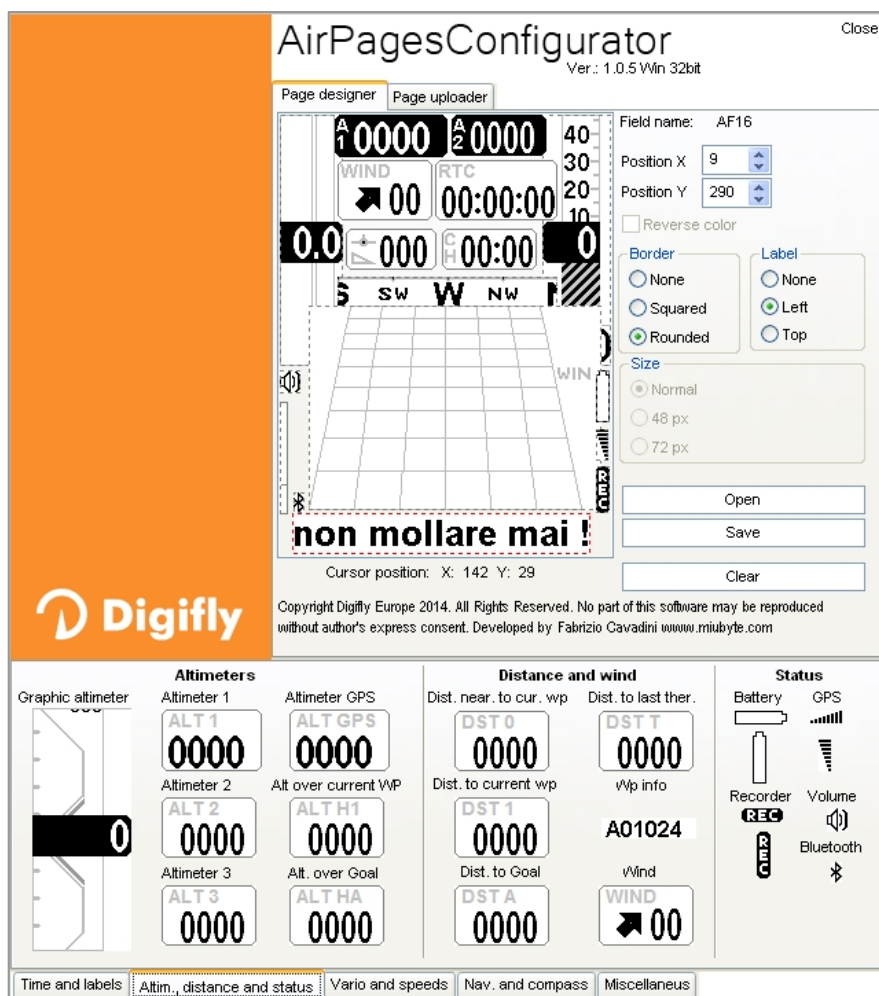
14.1.1 SOFTWARE Digifly AirTools (PC, MAC)

- It is an official Digifly software, it integrates the protocol Digifly v66
- The Digifly "AirTools" is a free application to be used on PC and MAC; it allows the full management of: flights, routes, waypoint, the help language of the "SETUP parameters" and the complete personalization of the vario's acoustic profile
- Connect the PC/MAC to the Digifly AIR and turn on both.
- On the **AIR**, enter in the menu "AirTools", the blinking message "LINK" is displayed
- Note : if Bluetooth is enabled you are prompted to press the  key or the  key to choose whether to communicate via USB cable or via Bluetooth with the message "Press OK to link USB, Press DOWN to link BT or Menu to exit". See paragraph 13.2.1 for more details on the use of Bluetooth
- On your PC/MAC run the Digifly program AirTools

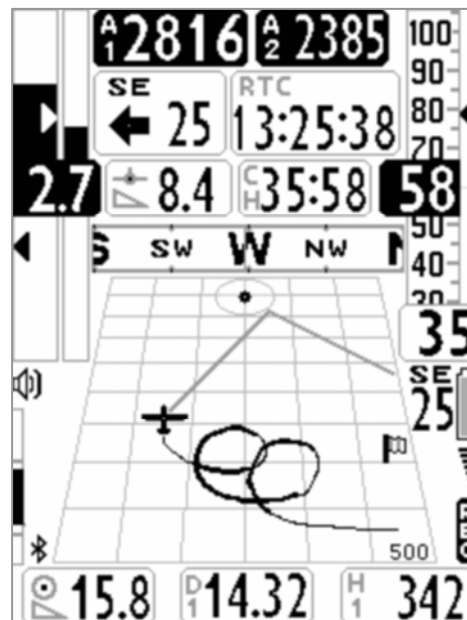


14.1.2 SOFTWARE Digifly AirPagesConfigurator (PC, MAC)

- Digifly software “AirPagesConfigurator” available for both Windows and MAC, freely downloadable on www.digifly.com web site, gives you the chance to create and graphically configure the “User Pages”, so that you can then update them on the 5 pages of AIR instrument .



Claudio3.dat



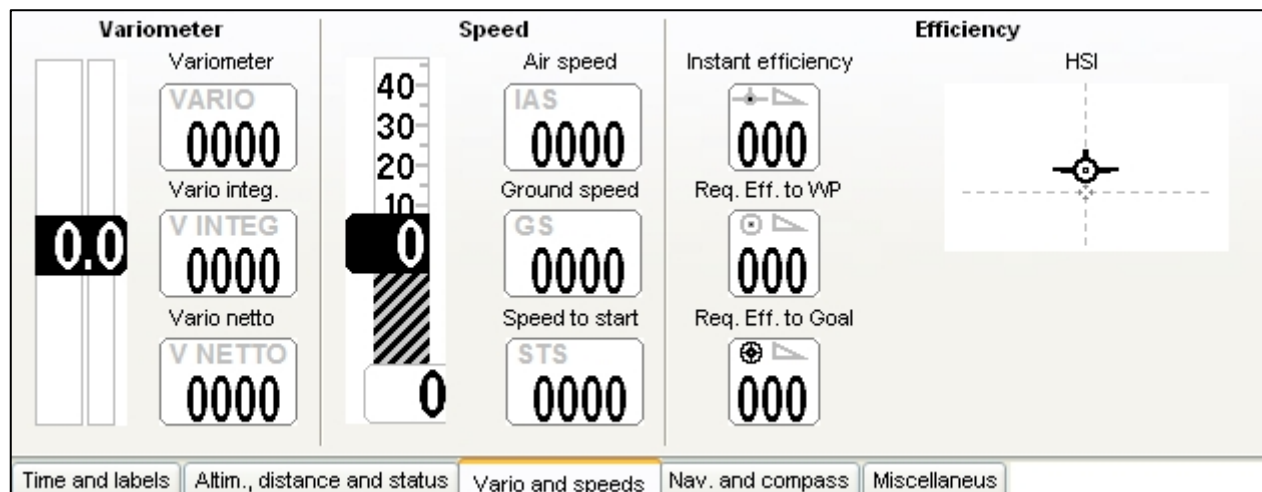
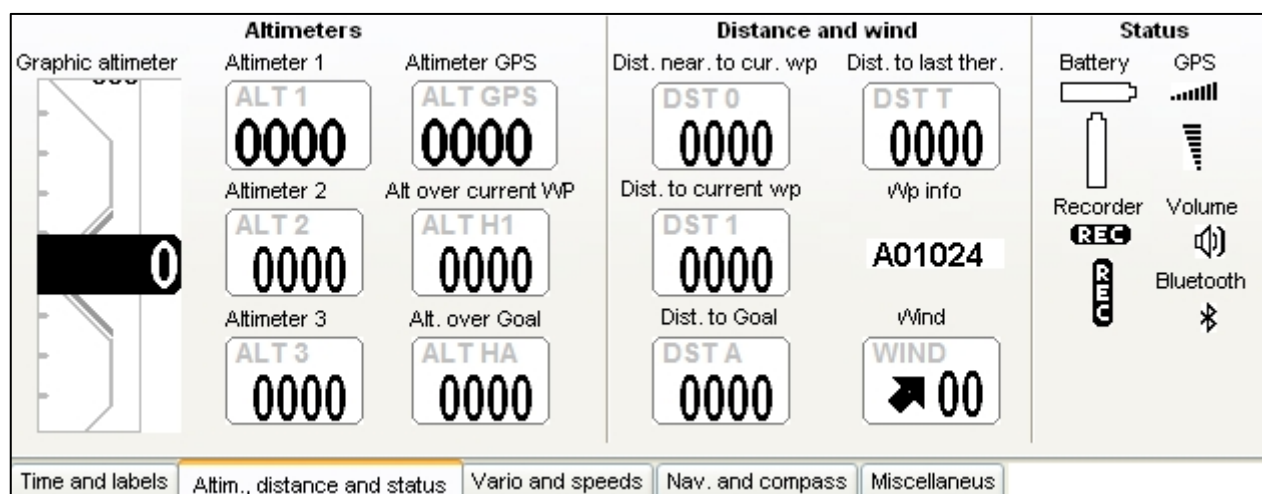
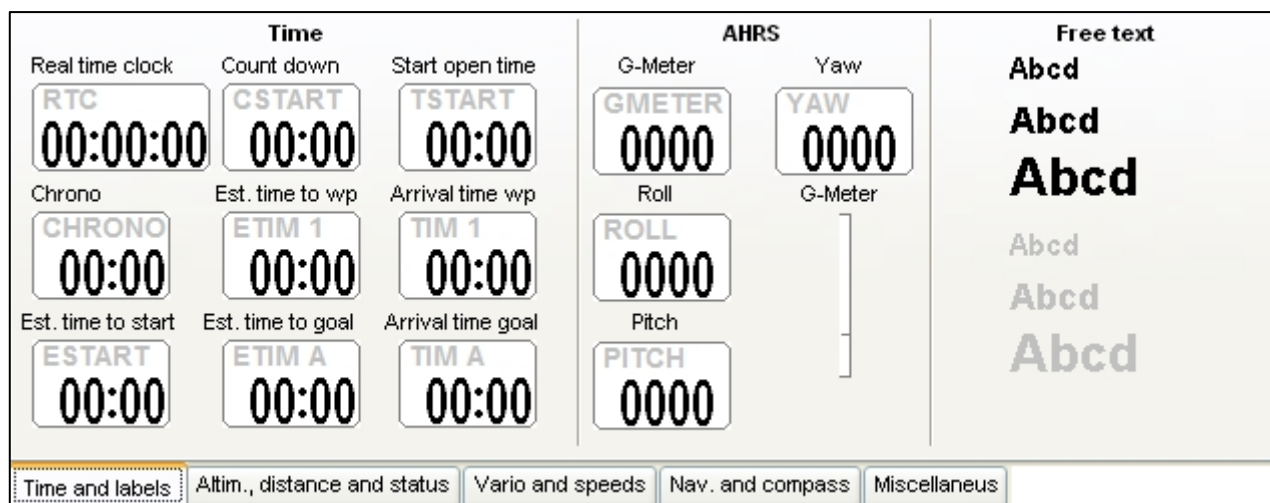
- Connect PC/MAC to Digifly and then power up both.
- On the instrument press button  (“MENU” function), choose "AirTools" on menù using the arrow buttons  ,  and then press button  . If Bluetooth is active (only AIR-BT) it will prompt to choose connection type: press button  for USB cable or press  for Bluetooth.
N.B. See chapter 13.2.2 for details for Bluetooth connection.
- On your PC/MAC run Digifly AirPagesConfigurator software.
- Its possible to start creating your own user page from a blank page or using one of the *.dat files available in the installation set up (click "Open" and choose a *.dat file , for example Claudio3.dat).
- Drag and release on workspace the desired elements.
- To cancel an element from workspace right click on it and select “delete”.
- To upload your page in the instrument: click on "Page uploader" click on "Set page" , select the configurable pages of your instrument on wich you want to upload your User page (i.e. "Pag 1"), click "Start" and wait untill upload is complete.

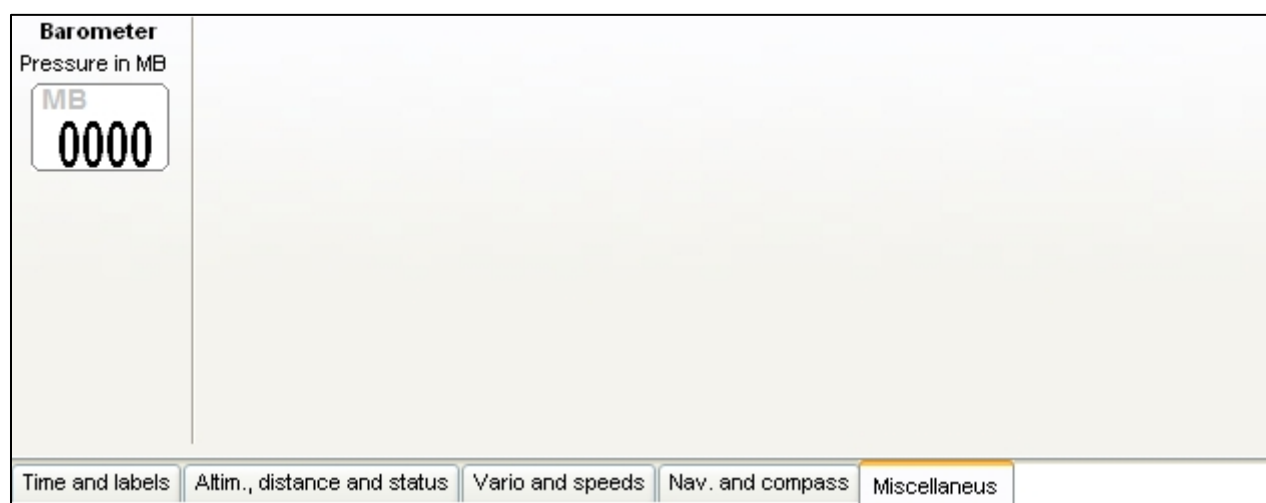
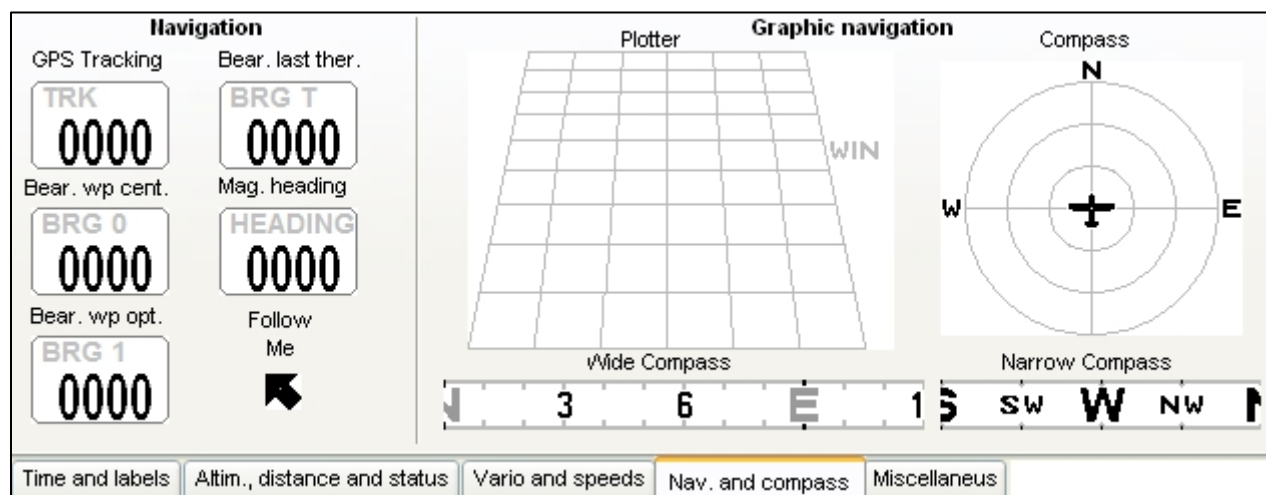
- In the AIR instrument set value "FULL" for the corresponding page that has been uploaded (in our example, Page 1, the parameter is **MAIN SETUP\ n. 18 U1PG**).
- In AIR instrument there are Five (5) configurable pages; at each one of them is linked one of the five (5) configurable parameters (**MAIN SETUP\ n. 18 U1PG**, **n. 19 U2PG**, **n. 20 U3PG**, **n. 21 U4PG**, **n. 22 U5PG**) and for each page is possible to configure a different layout:

OFF = the layout view of the page is disabled (the page will be skipped)

ON = will show the corresponding layout of the preset page uploaded by Digifly (Preset pages 1,2,3,4,5)

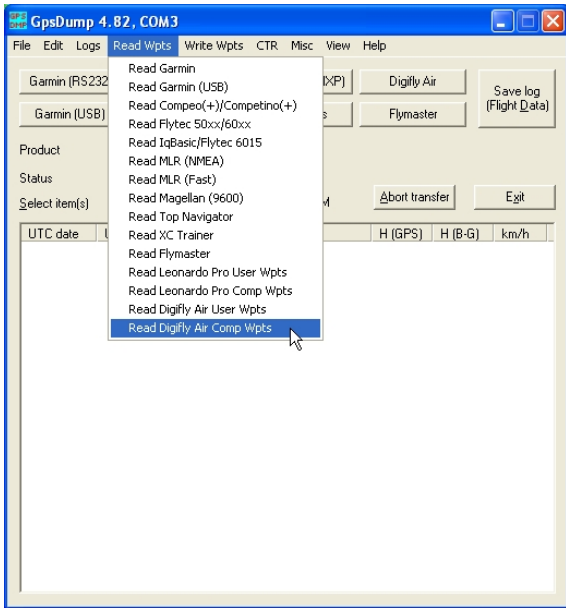
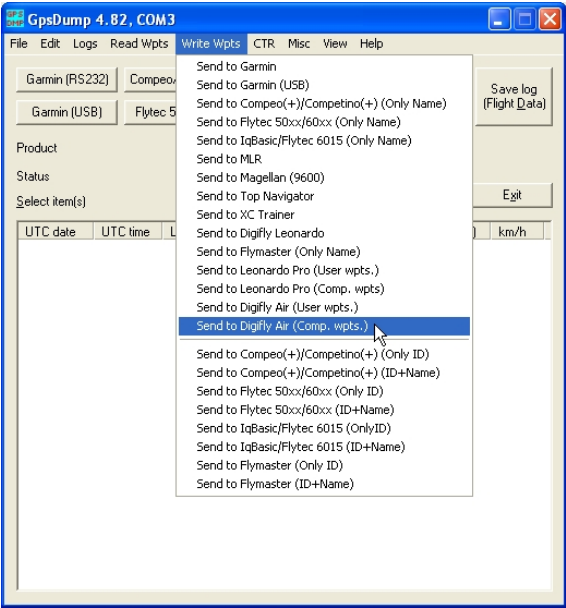
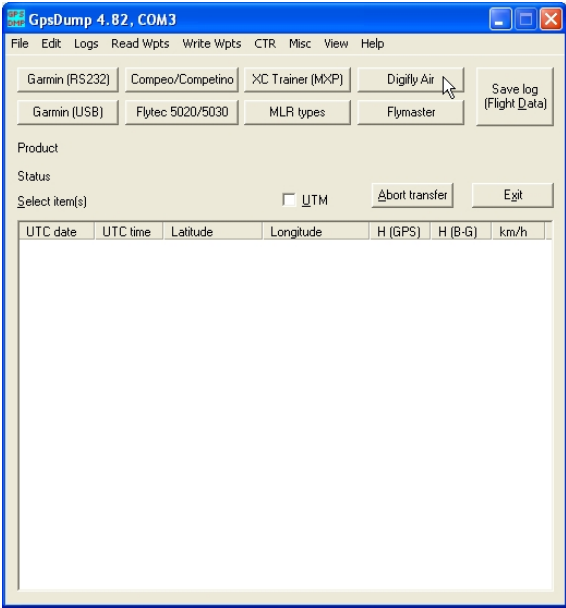
FULL = will show the corresponding layout of the page "User page 1,2,3,4,5" created and uploaded by the user using the free Digifly program **AirPageConfigurator**





14.1.3 SOFTWARE GpsDump (PC, MAC, ANDROID)

- GPSDump is the most commonly used free software among the free flight organizations to manage competitions, it integrates the “Digifly v66” protocol
- GpsDump allows the full management of: flights, routes and waypoint; these operations are also possible via Bluetooth by Smartphone
- On the **AIR**, enter in the menu "AirTools", the blinking message “LINK” is displayed
- Note : if Bluetooth is enabled you are prompted to press the  key or the  key to choose whether to communicate via USB cable or via Bluetooth with the message "Press OK to link USB, Press DOWN to link BT or Menu to exit". See paragraph 13.2.1 for more details on the use of Bluetooth
- Following sample images of some features of the program



14.2 SOFTWARE Digifly AirUpdater FOR FIRMWARE UPDATE (PC, MAC)

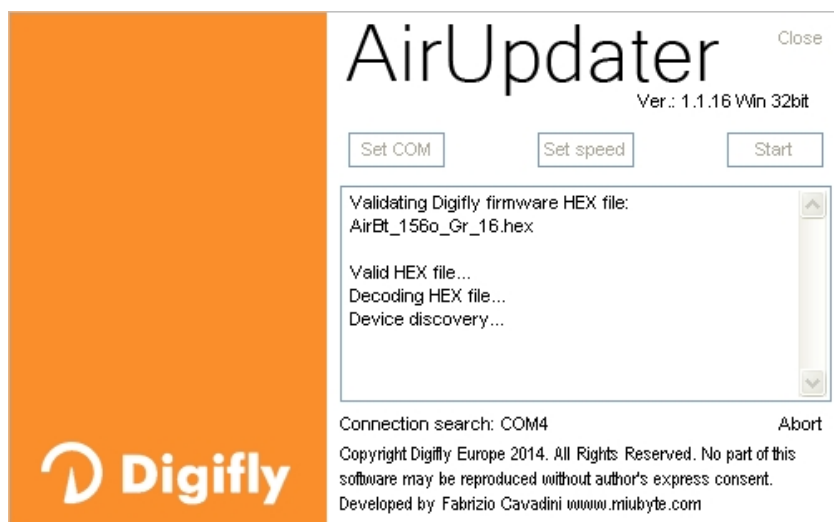
- The firmware of your Digifly instrument can be updated to new versions using the “AirUpdater” Digifly software available for Windows PC and MAC. This free software can be downloaded from our web site www.digifly.com and allows you to acquire new functions and improvements to your instrument. The firmware update works only with the USB cable. Note: it is not possible to update the firmware via the Bluetooth connection.

14.2.1 FIRMWARE UPDATE PROCEDURE

- 1) Ensure that your instrument's battery is fully charged. It is important!
- 2) Close all other PC/MAC programs that are running included the antivirus & firewall
- 3) Ensure that the instrument is turned off and connect the USB cable.
- 4) Press and hold the key , then press also the key , wait with the two key presses until the instrument emits a long acoustic “beep”. Now the instrument is turned on and is in “boot loader mode”, waiting for the firmware upload. Note: the screen will be totally blank at this point
- 5) Release first the key  and then the key .
- 6) Run on your PC/MAC the Digifly firmware's updating program "AirUpdater.exe"
- 7) Press the Start button, select the firmware file (e.g. AirBt_240b_Gr_16.hex) and confirm.
The com port and the speed are automatically managed so you do not need to setup them.
If you need to upload the same firmware version : right click on the Start button, click on "Force full firmware update" then select the firmware file and confirm.
- 8) The update requires about 10 minutes, once finished your computer will provide an acoustic and visible message then the Air instrument will switch off automatically.
- **Important !** if the update fails, the instrument's memory could be wiped, so it will not work. If this happens, the instrument may quickly discharge the battery BUT IT IS NOT BROKEN .

To restore it is necessary to reset it and to recall at the same time the "bootloader mode" :

- o press and hold pressed together the 3 keys ,  and 
- o wait 5 seconds then release the key  ; the instrument emits a long acoustic “beep”.
- o Release first the key  and then the key . Now the instrument is turned on and it is in “boot loader mode”, waiting for the firmware upload. Note: the screen will be totally blank at this point
- o restart from the step 6)



15 DIGIFLY TELEMETRY HIGH SPEED REAL TIME DATA OUTPUT (AIR-BT ONLY)

- When this feature is activated, the instrument AIR-BT via Bluetooth, send continuously and in real time the Digifly telemetry data at high speed (10 times per second) to external devices such as smartphones, tablet, PDA, Navigators for Cars, Palm , Pocket PCs that have installed software that can receive, decode and display the Digifly telemetry data such **XCSoar** and **LK8000** (see paragraphs 15.2 and 15.3).

15.1.1 ACTIVATE DIGIFLY TELEMETRY DATA OUTPUT

- To enable the Digifly telemetry output set the parameter (ADVANCED SETUP \ n. 24 BLUT = "ON") that enables Bluetooth and set the parameter (ADVANCED SETUP \ n. 23 TELE) with CAR or FL1 or FL2 telemetry type.
N.B. The **XCSoar** and **LK8000** both require the "FL2" type.

15.1.2 TELEMETRY DATA SELECTION

- Select the telemetry data type with the parameter (ADVANCED SETUP \ n. 23 TELE) :
- TELE=CAR : \$GPGGA , \$GPRMC sent one time per second
- TELE=FL1 : \$GPGGA , \$GPRMC , \$PDGFTL1 sent one time per second
- TELE=FL2 : \$GPGGA , \$GPRMC sent one time per second, \$PDGFTL1 sent 10 times per second
- SETTINGS DATA COMMUNICATION : **115200 baud** , no parity , 8 data bit , 1 stop bit
- The field Nmea checksum is composed by "*" and 2 hex digits representing the "exclusive OR " \$GPGGA, 161229.487, 3723.2475, N, 12158.3416, W, 1, 07, 1.0, 9.0, M, , , , 0000*18<CR><LF>

Name	Example	Unit	Description
Message ID	\$GPGGA		GGA protocol header
UTC Position	161229.487		hhmmss.sss
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.3416		Dddmm.mmmm
E/W Indicator	W		E=east or W=west
Position Fix Indicator	1		See Note 3
Satellites Used	07		Range 0 to 12
HDOP	1.0		Horizontal Dilution of Precision
MSL Altitude	9.0	meters	
Units	M	meters	
Geoid Separation		meters	
Units	M	meters	
Age of Diff. Corr.		second	Null fields when DGPS is not used
Diff. Ref. Station ID	0000		
Checksum	*18		Nmea checksum
<CR><LF>			End of message termination

\$GPRMC, 161229.487, A, 3723.2475, N, 12158.3416, W, 0.13, 309.62, 120598, ,A*10<CR><LF>

Name	Example	Unit	Description
Message ID	\$GPRMC		RMC protocol header
UTC Position	161229.48		hhmmss.sss
Status	A		A=data valid or V=data not valid
Latitude	3723.2475		ddmm.mmmm
N/S Indicator	N		N=north or S=south
Longitude	12158.341		dddmm.mmmm
E/W Indicator	W		E=east or W=west
Speed Over Ground	0.13	knots	
Course Over Ground	309.62	degrees	True
Date	120598		ddmmyy
Magnetic Variation		degrees	E=east or W=west
Mode	A		A=Autonomous, D=DGPS, E=DR
Checksum	*10		Nmea checksum
<CR><LF>			End of message termination

\$PDGFTL1,2025,2000,250,-14,45,134,28,65,382,153*3D<CR><LF>

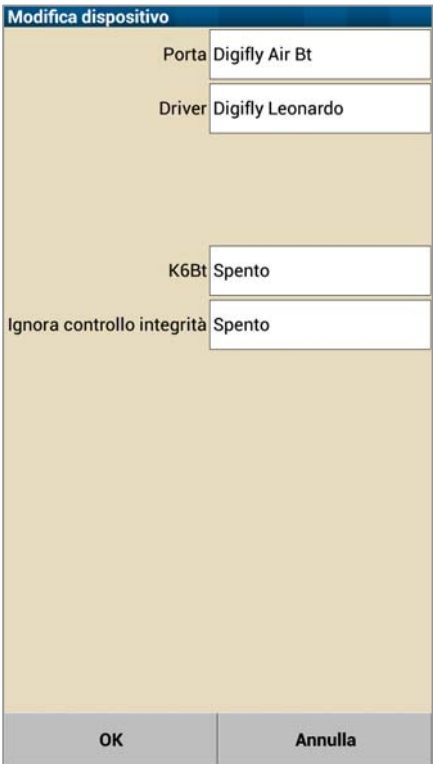
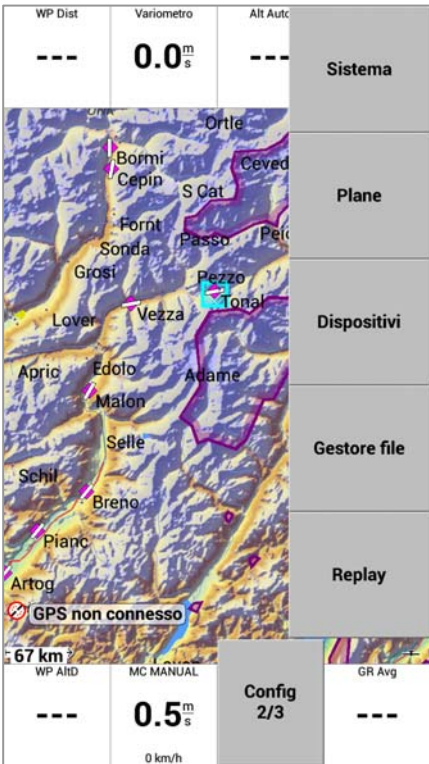
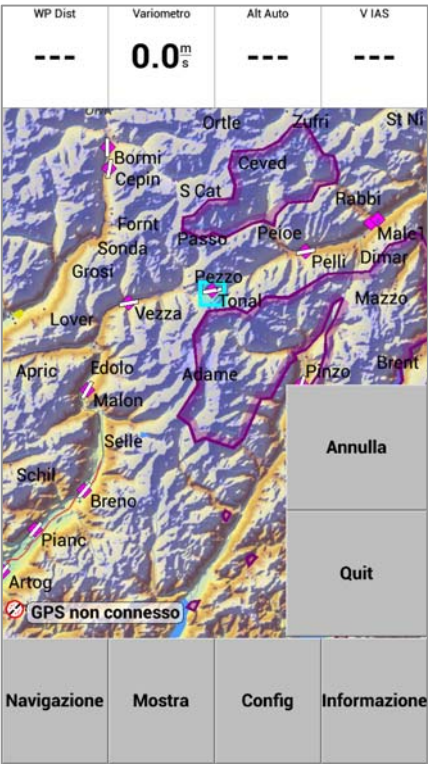
Name	Example	Unit	Description
Baro Altitude QNE(1013.25)	2025	meter	2025 mt
Baro Altitude QNH	2000	meter	2000 mt
Vario	250	cm/sec	+2,50 m/s
Netto Vario	-14	dm/sec	-1,40 m/s
Indicated Air Speed	45	km/h	45 km/h
Ground Efficiency	134	ratio	13,4 : 1
Wind Speed	28	km/h	28 km/h
Wind Direction	65	degree	65 degree
Main Lithium Battery Voltage	382	0.01 volts	3,82 volts
Backup AA Battery Voltage	153	0.01 volts	1,53 volts
Checksum	*3D		Nmea checksum
<CR><LF>			End of message termination

15.2 DIGIFLY TELEMETRY DATA CONNECTION WITH XCSOAR (AIR-BT ONLY)

- The free **XCSOAR** software running on an external device (eg SmartPhone, Tablet, PDA ,Car navigator, Pocket-PC) receives , decodes and displays Digifly telemetry data sent in real time at high speed by the **AIR-BT** via Bluetooth.
- In order to use the **XCSOAR** software you must have already previously done (only once) the pairing procedure with the external device (see 13.2.1). It also requires that the parameter (ADVANCED SETUP \ n. 24 BLUT) is set to "ON" (Bluetooth enabled) and that the parameter (ADVANCED SETUP \ n. 23 TELE) is set to "FL2" (sending Digifly telemetry data enabled).

The sequence of operations for using this software via Bluetooth is the following:

- 1) in the **AIR-BT**, enter in the menu “**Telemetry BT**”
 - 2) run the **XCSOAR** software on the external device
 - 3) when **AIR-BT** receives from the external device the confirmation of connection it automatically exits from the "Telemetry BT" menu, returns on the current page of instruments, turn on the Bluetooth icon and activate the continuous transmission of real-time Digifly telemetry data at high speed
- In case of problems, to exit press the  key on the **AIR-BT**.
 - To correctly decode the Digifly telemetry is necessary (only once) to enter in the XCSOAR configuration menu and enable the Device Driver = "Digifly Leonardo" and Port = "Digifly AIR BT".
 - If everything is correct, the "Monitor" page of XCSOAR will display the telemetry data transmitted from the instrument AIR-BT.
 - For more info about the **XCSOAR** software please visit the web site www.xcsoar.org



Monitor porta: Bluetooth Digifly Air Bt

1

SPDGFTL1,-17.76,-13.0,375.38

SPDGFTL1,-17.76,-14.0,377.3D

SPDGFTL1,-17.76,-15.0,377.3C

SPDGFTL1,-17.76,-15.0,375.3E

SPDGFTL1,-17.76,-17.0,375.3C

SPDGFTL1,-17.76,-18.0,375.33

SPDGFTL1,-17.76,-19.0,376.31

SGPRMC,162437.094,V,0.00,0.00,17

1113,N+41

SGPGGA,162437.094,0.0,M,M,4

0

SPDGFTL1,-17.76,-26.0,377.3C

SPDGFTL1,-17.76,-26.0,376.3D

SPDGFTL1,-17.76,-26.0,376.3D

SPDGFTL1,-17.76,-25.0,376.3E

SPDGFTL1,-17.76,-25.0,376.3E

SPDGFTL1,-17.76,-24.0,377.3E

SPDGFTL1,-17.76,-23.0,377.39

SGPRMC,162438.094,V,0.00,0.00,17

1113,N+4E

SGPGGA,162438.094,0.0,M,M,4

F

SPDGFTL1,-17.76,0.0,377.25

SPDGFTL1,-17.76,2.0,377.27

SPDGFTL1,-17.76,4.0,377.21

SPDGFTL1,-16.77,6.0,376.22

SPDGFTL1,-16.77,8.0,375.2F

SPDGFTL1,-16.77,10.0,375.16

SPDGFTL1,-16.77,12.0,375.14

SGPRMC,162439.094,V,0.00,0.00,17

1113,N+4F

SGPGGA,162439.094,0.0,M,M,4

F

SPDGFTL1,-17.76,15.0,375.13

SPDGFTL1,-17.76,14.0,376.11

SPDGFTL1,-17.76,13.0,375.15

SPDGFTL1,-17.76,13.0,375.15

SPDGFTL1,-17.76,13.0,376.16

SPDGFTL1,-17.76,13.0,377.17

SPDGFTL1,-17.76,12.0,376.17

Chiudi

Annulla

Riconnetti

Pausa

Dispositivi

A: GPS integrato & sensori

No dati

B: Digifly Leonardo su Bluetooth Digifly Air Bt

Connesso; Barometro; Airspeed; Variometro

C: Disabilitato

Disabilitato

D: Disabilitato

Disabilitato

E: Disabilitato

Disabilitato

F: Disabilitato

Disabilitato

Chiudi

Disable

Riconnetti

Download volo

Modificare

Gestisci

Monitor

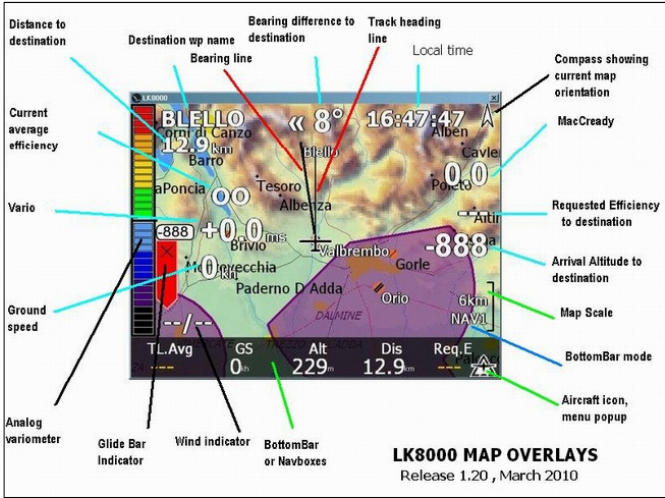
Debug

Parameter	Value
WP DIST	0.00 km
FIN DIS	307 km
H GPS	1264 m
H AGL	1236 m
MACCREADY	1.6 m/s
ALTRN 1	163°
MANUAL FIN ETE	03:54
121Stoelln OLC	16.0 km
54	22.3 pts

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15.3 DIGIFLY TELEMETRY DATA CONNECTION WITH LK8000 (AIR-BT ONLY)

- The free **LK8000** software running on an external device (eg SmartPhone, Tablet, PDA ,Car navigator, Pocket-PC) receives , decodes and displays Digifly telemetry data sent in real time at high speed by the **AIR-BT** via Bluetooth.



- In order to use the **LK8000** software you must have already previously done (only once) the pairing procedure with the external device (see 13.2.1). It also requires that the parameter (ADVANCED SETUP \ n. 24 BLUT) is set to "ON" (Bluetooth enabled) and that the parameter (ADVANCED SETUP \ n. 23 TELE) is set to "FL2" (sending Digifly telemetry data enabled).

The sequence of operations for using this software via Bluetooth is the following:

- 1) in the **AIR-BT**, enter in the menu “**Telemetry BT**”
- 2) run the **LK8000** software on the external device
- 3) when **AIR-BT** receives from the external device the confirmation of connection it automatically exits from the "Telemetry BT" menu, returns on the current page of instruments, turn on the Bluetooth icon and activate the continuous transmission of real-time Digifly telemetry data at high speed

- In case of problems, to exit press the  key on the **AIR-BT**.
- To correctly decode the Digify telemetry is necessary (only once) to enter in the LK8000 configuration menu and enable the Device Driver = "Digify Leonardo" and Port = "Digify AIR BT".
- If everything is correct, the "Monitor" page of LK8000 will display the telemetry data transmitted from the instrument AIR-BT.
- For more info about the **LK8000** software please visit the web site www.lk8000.it

16 APPENDIX

16.1 DIGIFLY AIR STANDARD ACCESSORIES

- The Digifly AIR-SE and AIR-BT are shipped with the following standard accessories:
- Protective case.
- Internal rechargeable lithium battery.
- Battery charger 5V 1000ma (110-220Vca 50-60Hz).
- USB PC cable to download flights, manage other functions and update the firmware directly from Internet

16.2 OPTIONAL ACCESSORIES

- The following optional accessories are available from Digifly:
- Air Speed Sensor Pitot tube
- GSM LiveTracking module for mobile sim card
- Hang gliding vario mount
- Paragliding protective case

16.3 TECHNICAL FEATURES

16.3.1 STANDARD FUNCTIONS

- Graphic altimeter
- Altimeters 9,000 m (29527 ft)
- Auto Altimeter A1 with GPS Altimeter synchro
- Auto zero thermal altimeter A3
- Thermal Tutor with autozoom and real time map of the thermal with different thickness depending on the vario
- **10 Sensors Vario** (barometer +9 sensors inertial platform) with **self-adaptive sensitivity** function
- Digital vario +/- 25 m/s (5000 ft/min)
- Analogue vario +/- 25 m/s (5000 ft/min)
- Vario integrator adjustable from 0 to 60 sec
- Netto Vario (with optional Pitot tube)
- McCready and Equivalent McReady function (with optional Pitot tube)
- Total energy compensation (with optional Pitot tube)
- Acoustic vario with adjustable levels, volume, tone and vario simulator function
- Acoustic vario with "pre-thermal" function
- Acoustic vario with "autosilence" function
- Air Speed IAS / TAS (with optional Pitot tube)
- Speed To Fly (with optional Pitot tube)
- 3 adjustable polar curves (with optional Pitot tube)
- Barometer (range 300 to 1200 mB) with user calibration
- Constant battery monitoring.
- Date and time with auto GPS synchro, chronometer, flight timer.

16.3.2 ADVANCED FUNCTIONS

- Inertial platform AHRS with 3 axis gyroscopes, 3 accelerometers and 3 magnetometers
- Three axis magnetic compass
- Three axis Gmeter
- Pitch
- Roll
- Yaw

16.3.3 GPS FUNCTIONS

- Integrated high sensitivity GPS receiver 99 channels and 10hz
- Latitude, Longitude, Altitude GPS, Direction GPS (TRK), Ground Speed GPS
- Efficiency (Glide Ratio) related to the ground (with GPS ground speed).
- Wind speed and direction indicator (with GPS)
- Direction and distance to the last thermal
- HSI graphic navigation function
- "Follow Me" Navigation function
- "GOTO HOME" Navigation function
- "GOTO LANDINGS" and "GOTO NEAREST" Navigation functions
- Direction, distance, height, efficiency and time to the current Waypoint.
- Direction, distance, height, efficiency and time to the GOAL
- Optimized navigation management with shortest path indications and Glide calculator
- Real Time Navigation Manager with skip waypoint function
- Automatic FAI cylinder turn point and Start Pylon validation (visual and acoustic).
- Start Pylon full management with indications of : start pylon opening time, time to opening, estimated relative time to the Start cylinder, requested speed to arrive to the Start cylinder
- Automatic Start Pylon display switching function
- 186 Competition Waypoints + 186 User Waypoints
- 12 Routes with 20 Waypoints on each Route.
- Multiflight logger 3D recorder (flight data and GPS) with Autostart and Autostop
- 100.000 data points flight recorder: from 1800 hours (1 point per minute) to 30 hours (1 point per second)
- Up to 250 recordable flights.
- Controlled air spaces (CTR) management

16.3.4 GENERAL SPECIFICATIONS

- Very high resolution, gray scale, graphic LCD display 320x240 pixel
- 13 Graphic screens completely configurable by the user with simple "drag & drop" using the graphical free software Digifly AirPageConfigurator for PC and Mac
- Free Digifly AirTools vario management software for PC and Mac
- Compatible with the GpsDump free software for PC, Mac and Smartphone Android
- Compatible with mostly of the competition software programs and with the Online XC Contest
- USB data communication
- Bluetooth data communication (AIR-BT only)
- High Speed real time Digifly Telemetry data output 10 times per second via Bluetooth (AIR-BT only)
- Telemetry via Bluetooth compatible with the free software XCSOAR and LK8000 (AIR-BT only)
- Free Firmware update via internet
- 14 Language for help setup
- Adjustable units of measure.
- Micro SD Memory Card slot
- Ready for installation of the optional Pitot tube and sensor kit
- Ready for installation of the optional GSM LiveTracking module for mobile sim card
- Input for external power supply
- Integrated battery charger via mini USB
- Battery life 30 hours with the integrated rechargeable lithium battery
- Dimensions (H x L x D) 154mm x 90mm x 18mm
- Weight (with battery) 180g
- The Digifly AIR instruments are supplied with protective case, rechargeable internal lithium battery, wall adapter charger (110-220Vca 50-60Hz) and USB cable
- Three years warranty.

16.4 MAIN SET UP MENU PARAMETERS

n	Name	Description	Range	Default	Units
1	CTRS	display contrast	1 - 99	36	%
2	LANG	language selection	USR/ UK /ITA/ESP/DEU/FRA/CZE/HUN/PLN/GRK/TRK		
3	RECM	recorder mode selection	OFF/ALW/AUT	AUT	---
4	R.DS	meters variation start autorecorder	0.1 - 5	0.5	m/s
5	R.TI	seconds variation start autorecorder	1 - 30	3	sec
6	RECR	recorder rate	1 - 60	3	sec
7	UTCO	time zone difference	-15/+15	2	ore
8	HOUR	time setting: hours	0 - 23	---	ore
9	MIN	time setting: minutes	0 - 59	---	min
10	DAY	time setting: day	1 - 31	---	days
11	MONT	time setting: month	1 - 12	---	months
12	YEAR	time setting: year	0 - 99	---	years
13	U-AL	altimeter units	MT/FT	MT	---
14	U-SP	speed units	KMH/MPH	KMH	---
15	PILO	pilot's name	6 letter	ABCDEF	---
16	GTYP	glider type	6 letter	ABCDEF	---
17	GID	glider ID	6 letter	ABCDEF	---
18	U1PG	User Page 1 mode	OFF/ON/FULL	ON	---
19	U2PG	User Page 2 mode	OFF/ON/FULL	ON	---
20	U3PG	User Page 3 mode	OFF/ON/FULL	ON	---
21	U4PG	User Page 4 mode	OFF/ON/FULL	ON	---
22	U5PG	User Page 5 mode	OFF/ON/FULL	ON	---

16.5 ADV-SETUP PARAMETERS MENU (ADVANCED SETUP)

n	Name	Description	Range	Default	Unit
1	PITO	Pitot tube enable	OFF/IAS/TAS	OFF	---
2	KMAG	Magnetic compass calibration	50 - 200 %	100	%
3	KIAS	air speed calibration	50 - 200 %	100	%
4	KBAR	barometer calibration	+/- 20.0	0.0	mB
5	GCAL	AHRS calibration	MAN/AUT	AUT	
6	GPOS	AHRS position	LEFT/CENT/RIGHT	CENT	
7	EFF	real time average glide ratio	1 - 30	3	sec
8	EFFA	average glide r.for HW calc.	1 - 100	15	sec
9	POLA	polar selection	OFF/P1/P2/P3	OFF	---
10-11-12	P1-A P1-B P1-C	polar 1 coefficients		xxx	---
13-14-15	P2-A P2-B P2-C	polar 2 coefficients		xxx	---
16-17-18	P3-A P3-B P3-C	polar 3 coefficients		xxx	---
19	MCRA	McCready average time	0.2 - 30	10.0	min
20	MCRE	McCready equiv average time	0.1 - 3	0.4	sec
21	WSEN	wind calculator sensibility	3 - 15	5	---
22	CORD	GPS coordinates type lat lon	DMM/DMS/UTM	DMS	---
23	TELE	telemetry output enable	OFF/CAR/FL1/FL2	OFF	---
24	BLUT	bluetooth module enable	OFF/ON	OFF	---

16.6 VARIOMETER SETUP PARAMETERS

n	Name	Description	Range	Default	Units
1	V.UP	acoustic vario lift setting	0 - 2.00	00.10	m/s
2	V.PT	acoustic vario pre-thermal setting	0 - 1.50	00.50	m/s
3	V.DN	acoustic vario sink setting	0 - 25.00	02.50	m/s
4	PROF	acoustic vario profiles	FAS/STD/SFT/US1/US2/MAN	MAN	---
5	STYL	rythm style tone in lift	0 - 2	1	---
6	MODH	frequency modulation in lift	1 - 30	4	---
7	PITC	tone rhythm in lift	1 - 8	4	---
8	UPHZ	base frequency in lift	500 - 1400	700	Hz
9	DWHZ	base frequency in sink	350 - 1000	600	Hz
10	FLT1	filter 1	0 - 100	80	%
11	FLT2	filter 2	24 - 96	72	
12	FLT3	filter 3	0 - 100	0	%
13	RVAR	acoustic vario sensitivity	0 - 48	0	---
14	INTE	integrator vario delay	0 - 60	10	sec
15	CRUT	glide detect time threshold	1 - 60	30	sec
16	THET	thermal detect time threshold	1 - 30	2	sec
17	TEC	total energy compensation	0 - 100	0	%
18	DSEL	vario bargraph mode	0/1/2/3/4	0	---
19	SIMV	vario simulator	ON/OFF/FULL	OFF	---
20	AUTV	automatic acoustic vario	OFF/ON	ON	---

16.7 RESTORE FACTORY SETTINGS (DEFAULT PARAMETERS)

- To restore the factory settings (default parameters) and default screen setups, turn on the instrument pressing at the same time the  and  keys until the message “FACTORY SET?” appears.

If you want to confirm pressing the key  & the message “SETUP RESET” will appear. Otherwise, press the key  to cancel the restore.

16.8 RESET

- In case of a system crash, to reset the instrument, press at the same time the arrow key  and the power on key  for over 5 seconds .